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SOME CONCEPTS IN RELATION TO SOCIAL SCIENCE.¹

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"This is the enemy of true progress—this belief that things have been already settled for us and the consequent result of considering proposals not on their merits but in reference to a system of principles which is for the most part a survival from primitive civilizations."

JULIAN HUXLEY.⁽¹⁾

I.

To the student of to-day nothing is more striking than the change of atmosphere he breathes when he passes from the realm of physical science to that of social science. In the former he finds a spirit of inquiry, an openness of mind, an adventure of discovery, an appeal from the prejudices of the past to the facts of observation and experiment; in the latter, a stifling of investigation, a fear of discovery, an aversion to experiment, and the overshadowing power of tradition. It is this difference in atmosphere that most clearly marks off inquiry into things physical from that into things social. Most men come to the latter as partisans, not as investigators. If we raise a question concerning the qualities and uses of a metal, everyone will agree to refer the problem to the scientist and technician for solution; but if we raise a problem of social relations, the idea that it is desirable that it should be treated scientifically, hardly enters the heads of even the framers of public opinion. *They* know; have they not their own experience to guide them? This profound difference in attitude is the result partly of the historical development in the two fields and partly of the different relation in which man stands to physical and to social phenomena.

If we judge by the time-standards of life on the earth, it was but yesterday that the right of free inquiry in physical

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science was won; the echoes of the conflicts in which Bruno, Galileo, and Kepler played such valiant parts still ring in our ears. Man has come to expect in this field not the old demand for certainty but the new desire for progress. With free inquiry has developed the scientific attitude. Social scientists are but now demanding that in their realm inquiry shall be free and subjects treated scientifically. Unfortunately, in this field magic still lingers; hence the continued refusal to permit the free play of the spirit of inquiry. In recent times many writers have made us aware of the difficulties that arise when we try to treat scientifically social subjects in which the very terms we use bear the emotional impress of a long past and the affective influence of a dogma. Graham Wallas⁽²⁾ writes: "The political part of our social heritage normally reaches us in the form of large vague words which are used for the names of political parties or as rallying-cries during an election." Bertrand Russell⁽³⁾ assures us that it is fear that keeps men back. Hobson,⁽⁴⁾ too, has indicated the many ways in which thinking on social matters is either diverted from its end, or even suppressed, by narrow interests. "A chief obstacle to the disinterested pursuit of the social sciences," he says, "is the vital, not to say inflammatory, matter they contain. The fundamental institutions of society are hedged with a mysterious sanctity that forbids the scrutiny of reason. . . ."

"The upshot of this discussion is the urgent need to realize the new intensity of the conflict waged on several fronts between the forces of disinterested reason and the special interests, economic, racial, national, class, sex, individual, in all the sciences which deal with the ideas, feelings, and activities concerned in the various departments of social conduct." It is true that Bury,⁽⁵⁾ writing before the war, told us that "The struggle of reason against authority had ended in what appears now to be a decisive and permanent victory for liberty"; but it is clear that he had the question of physical science in the focus of his attention for he added, "But if science seems pretty safe, it is always possible in countries where the scientific spirit is held in honour, nevertheless, serious restrictions may be laid on speculations touching social, political and religious questions." The war-years and the post-war period have shown how near that danger is; real freedom, it is certain, is never handed to a people; it must always be won anew.

Modern psychology has shown, also, that the springs of many of our reactions are much deeper and more completely hidden than we had been led to imagine. The more obvious difficulties point to deeper sources; these are the more potent

but obscure obstacles against which thought has to struggle and from which the tendency to suppress opinion really arises. Objections and fears so often depend on what the objectors and the fearful do not realize—ignorance of fundamental notions or conflict among them. This is of course not a new discovery, but we are being made more conscious of the results and of the means by which they are produced and by which they may be avoided.

At each stage in his history man has tended to be governed by some dominant concept; he has seen the world through a glass of one colour, or, to use Lippmann's⁽⁶⁾ expressive term, a "stereotype." The rise of the study of mathematics was followed by the endeavour to describe the whole world of thought and things in terms of mathematical relations. With the development and splendid achievement of physical science there was an irresistible tendency to force all relations—even those of life—into this special mould. Whitehead,⁽⁷⁾ in his well-known work, has traced the influence of physical conceptions in scientific and philosophical systems and has given some indications of the evil results produced. He writes: "Now the scientific philosophy of this age (17th century) was dominated by physics; so as to be the most obvious rendering, in terms of general ideas, of the state of physical knowledge of that age and of the two succeeding centuries. As a matter of fact, these concepts are very unsuited to biology, and set it an insoluble problem of matter and life and organism with which the biologists are now wrestling. But the science of living organisms is only now coming to a growth adequate to impress biological notions upon the materialism of the seventeenth century. However this success be estimated, it is certain that the root ideas of the seventeenth century were derived from the school of thought which produced Galileo, Huyghens, Newton and not from the physiologists of Padua. One unsolved problem of thought, so far as it derives from this period, is to be formulated thus: Given configurations of matter with locomotion in space as assigned by physical laws, to account for living organisms." The triumphant success of these physical conceptions established the jail in which the human mind became imprisoned and from which it is only now beginning to escape. As our author tersely says: "The history of thought in the 18th and 19th centuries is governed by the fact that the world had got hold of a general idea that it could neither live with nor live without." Indeed a real revolution is taking place for there is clearly appearing a tendency to attack the problem from the other end. Among other writers J. S. Haldane⁽⁸⁾ is impressed with the need of a different approach to these

questions: "We reach the scientific conception of a physical world by a process of abstraction from psychological apprehension, and by the help of this process of abstraction we are enabled to extend enormously our power of prediction where fuller apprehension is lacking. The physical world remains nevertheless the world of abstractions and if we endeavour to apply ordinary physical conceptions to the phenomena of life the unreality of these abstractions becomes so evident that they are of only limited practical service." In an article on "Neo-Mechanism" in the January *Hibbert*, Joseph Needham urges that in biology the physical concepts are necessary but have only a methodological value. These physical notions, however, enabled man to hold together and to use as a mechanical system the world of physical things. But this world had to be conjoined with men conceived as self determining beings. This apparent contradiction, implicit in the Cartesian system, has manifested itself in subsequent thought, taking on a form appropriate to the ideas of the day. Attempts to remove the contradiction have ended either in a world of pure self-developing forms or in a world in which human beings are but complicated machines. In the practical sphere man obtained a really amazing power to control physical forces without developing in himself the qualities which would insure the use of this power for the general good. Both east and west seem to be coming to an agreement on this point. The English biologist, Arthur Dendy,⁽⁹⁾ tells us, "This new mental environment now leads the way in progressive evolution just as the physical environment did at lower stages. The mind has, so to speak, got ahead of the purely physical environment which henceforward takes a subordinate position. Progress must now consist in the formulation of high ideals and in adaptation to these." On the other hand the Hindoo sage, Rabindranath Tagore,⁽¹⁰⁾ sees the dominance of the mechanistic view in both east and west. "The civilization of the west," he writes, "has in it the spirit of the machine which must move; and to that blind movement human lives are offered as fuel, keeping up the steam-power. It represents the active aspect of inertia which has the appearance of freedom but not its truth and therefore gives rise to slavery both within its boundaries and outside. The present civilization of India has the constraining power of the mould. It squeezes living man in the grip of rigid regulations, and its repression of individual freedom makes it too easy for men to be forced into submission of all kinds and degrees. In both these traditions life is offered up to something which is not life; it is a sacrifice, which has no God for its worship and is therefore utterly in vain. For the west is continually

producing mechanical power in excess of its spiritual control, and India has produced a system of mechanical control in excess of its vitality."

Leaving, however, this general field, which is merely a background, I propose to consider the influence of two of these concepts (heredity and environment) on social thought and practice, and to indicate one of the means by which the ensuing evils may be lessened; it is perhaps too much to hope that they can be eradicated.

II.

In the second half of the 19th century the development of biological science based on the theory of evolution did not put an end to the antagonisms and contradictions to which I have referred. These merely took on a new form—the relative importance of heredity and environment. One or other of these ideas has, consciously or unconsciously, determined the viewpoints of different schools of biological, psychological, and sociological thought. Are organisms merely self-developing forms? Are they simply evolving powers handed down to them from generations long past? Or are acquired characters transmitted from one generation to the next? Opposing theories on this subject have led to extremely antagonistic views, theoretical and practical, in all branches of social science. The mechanistic and teleological views of life, the pessimistic and optimistic emotional reaction to existence, the conservative and radical tendencies in social thought and practice, all find here their intellectual explanation or justification.

No one will deny that the threefold root of social science is to be found in physics, biology and psychology. History shows that scientific treatment of these fields has appeared in that order, and that each of these terms is used to cover the uniformities found in the different fields (or in different aspects of the same field) that present qualities that are, to use Lloyd Morgan's term, emergent. Any object or organism may be looked at from two points of view: its native qualities and the modifications in these qualities that arise when the object or organism is considered in relation to other objects and other organisms. In actual fact these can never be separated though they may be distinguished. If we use the terms "heredity" and "environment" in their most general signification, they will indicate these two aspects. In the case of heredity we may further distinguish physiological factors from mental ones, and in the case of the environment we may likewise discern the physical and social aspects. Again, in neither case should these aspects be viewed as

independent. Just as the physicists imprisoned us in the mechanistic universe they constructed, so the biologists limited our freedom to think by the conceptions of heredity and environment they adopted. These views, naturally enough, spilled over into psychology and sociology when these sciences began to develop. In biology the struggle waged round the transmissibility of acquired characters. Herbert Spencer,⁽¹¹⁾ one of the first to attempt to base psychology and sociology on a biological foundation, felt the urgent need of the solution of this problem: heredity or environment—which? In 1887 in the Preface of “Factors of Organic Evolution,” he wrote, “Though the direct bearings of the arguments contained in this Essay are biological, the argument contained in its first half has indirect bearings upon Psychology, Ethics and Sociology. My belief in the profound importance of these indirect bearings was originally the chief prompter to set forth the argument; and it now prompts me to re-issue it in permanent form.” He explains his reference to Psychology and Ethics and concludes thus: “That our sociological beliefs must be profoundly affected by the conclusions we draw on this point, is obvious. If a nation is modified *en masse* by the transmission of the effects produced in the natures of its members by those modes of daily activity which its institutions and circumstances involve, then we must infer that such institutions and circumstances mould its members far more rapidly and comprehensively than they can do if the sole cause of adaptation to them is the more frequent survival of individuals who happen to have varied in favourable ways.

“I will add only that, considering the width and depth of the effects which acceptance of one or other of these hypotheses must have on our views of Life, Mind, Morals and Politics, the question—Which of them is true?—demands, beyond all other questions whatever, the attention of scientific men.” The increasing support given to the Germ Plasm Theory and the consequent denial of the possibility of the transmission of acquired characters from one generation to the next, gave rise to difficulties for Spencerian theory that its author felt increasingly during the decade that followed. The sharp division of opinion among biologists on this fundamental point seemed to Spencer to imply that advance in sociological knowledge must be held up till the question was settled. With increasing age he chafed at the delay and in 1894 his mental uneasiness found expression in these words (Weismannism Once More): “I have felt more and more that since all the higher sciences are dependent on the science of life and must have their conclusions vitiated if a fundamental

datum given to them by the teachers of this science is erroneous, it behoves these teachers not to let an erroneous datum pass current; they are called on to settle this vexed question one way or the other.”⁽¹²⁾

But the question could not be settled by the mere fiat of the biologist; it required the work of thirty years to give a satisfactory lead in this matter, and during these years the biological, psychological and sociological worlds were rent in twain: those for and against the transmission of acquired characters, those for and against the dominating influence of instinct, those for and against the inevitability of social events, those for and against the possibility of human control of life—the optimists and the pessimists. However much these tendencies may be obscured they have been actively at work and, behind all the temporary screens that men have set up, they have fashioned his thought and his action: on the one hand, the germ plasm theory and Mendelism, the supreme importance of mental heredity, the inevitability of the social future, the necessarily slow nature of progress; and on the other hand, Lamarckism and Neo-Lamarckism, the supreme importance of habits and institutions, the plasticity of the world that we may mould to our desires, the belief in cataclysmic progress.

III.

If I read the signs of the times aright an outstanding feature of modern thinking is the attempt to get away from the chains of the past, to free itself from the tendency to read into the phenomena what our theories and abstract terms seem to require and to pay attention rather to the phenomena themselves. “We must start,” as Whitehead⁽¹³⁾ tells us, “with the event as the ultimate unit of natural occurrence.” The older method was to try to frame mentally the conditions that had produced a certain result, and the truth of this hypothesis was dependent upon its fitting in with the facts. It brought with it the danger of tempting us to see the facts in such a form that they were covered by the hypothesis that had been provided for us or which we had “willed to believe,” or, in other cases, we developed such regard for our hypothesis that we avoided what Huxley called “the great tragedy of Science—the slaying of a beautiful hypothesis by an ugly fact” by conveniently overlooking the fact altogether. We are now becoming more conscious of the ease with which we can in these ways deceive ourselves, and this consciousness is our best defence. The demand now is that we shall see the process in progress. “In the new spirit of work,” writes Jennings,⁽¹⁴⁾ “the desire is to see things happening, not to conclude what

must have happened. If evolution occurs we wish to see it occurring, if acquired characters are inherited, we want to see a few acquired and inherited. We wish to see the processes themselves, not merely the result of supposed processes." This new direction in modern thought has led to results that have begun to bridge some of the great gulfs of the past, has begun to put an end to some of those antagonisms which, through the feeling and conflict they excited, have in these fields held up advance, theoretical and practical. Some of these antagonisms are indicated by the antitheses: mind and body; intelligence and instinct; impulse and habit; native and acquired characters. Whitehead⁽¹⁵⁾ would attempt the widest synthesis. "Science," he says, "is taking on a new aspect which is neither purely physical nor purely biological. It is beginning the study of organisms. Biology is the study of the larger organisms, whereas physics is the study of the smaller organisms." Many modern writers are demanding a reconsideration of the governing concepts in this group of sciences and a re-orientation to their problems. Dealing with Psychology and its relation to Biology McDougall⁽¹⁶⁾ writes: "I, for one, prefer to approach the problems of psychology with an open mind, and to seek such fundamental categories as may seem most useful and fruitful in the interpretation of human experience and human and animal behaviour, without prejudice. I refuse to be bound within the categories of the physical sciences, just because those sciences are, for historically intelligible reasons, more advanced than the biological sciences. I submit that the present time when all these categories of the physical sciences are obviously in the melting pot, is one when even the least independent biologist might be expected to find the courage to claim for his science its elementary rights."

IV.

In the field of sociology we find a similar tendency.

It is particularly fortunate—if it is not much more than a mere coincidence—that at the present time the root-problem, the biological problem, Spencer's problem, seems to be on the eve of solution, not in the way that Spencer anticipated by the triumph of one term of the antithesis and the defeat of the other, but by our realization that the antithesis rests on a false opposition. Modern biological work seems to show that it is impossible to fix any hard and fast line between the influences of heredity and those of environment. I do not mean that these words have ceased to carry distinctive meanings but only that the terms indicate aspects of the one event. To accept this view is not to deny the importance of

hereditary factors or to discount the importance of the contribution made by students of heredity to our knowledge of the nature of man. No change in point of view can bring to naught the results obtained by a Mendel or a Burbank, but it may compel us to look at their work in a rather different light, to give up the "all-or-none" reaction to either term of the antithesis and to be satisfied for the time with an apparently indefinite knowledge because we realize the complexity and continuity of the phenomena. From this point of view the organism floats in its environment of which it is for the time being the focus.

As the older interpretation of these concepts is still the popular one it seems necessary to justify the view put forward by appeal to some authorities. Jennings⁽¹⁷⁾ has stated the old view and compared it with the new one in a very striking manner. He writes: "From the fact that the unit characters changed when a single gene changed it was concluded that in some ill-defined way each characteristic was represented or in some way condensed or contained in one particular gene. There was one gene for eye-colour, another for stature, another for feeble-mindedness and so on. Every individual, therefore, came into the world with his characteristics fixed and determined. His whole outfit of characteristics was provided for him at the start; what he should be was pre-ordained; predestination in the present world was an actual fact. Environment might prevent or permit the hereditary characters to develop; it could do nothing more. Heredity was everything, environment almost nothing. This doctrine of the all-might of inheritance is still proclaimed by the popularizers of biological science.

"But this theory of representative particles is gone, clean gone. Advance in the knowledge of genetics has demonstrated its falsity. Its prevalence was a demonstration of the adage that a little knowledge is a dangerous thing. The doctrine is dead—though as yet, like the decapitated turtle it is not sensible of it. It is not true that particular characteristics are in any sense represented or condensed or contained in particular unit genes. Neither eye-colour, nor tallness, nor feeble-mindedness, nor any other characteristic, is a unit character in any such sense. There is indeed no such thing as a 'unit character,' and it would be a step in advance if that expression should disappear.

"What recent investigations have shown is this: Chemicals that were in the original packages derived from the parents—the genes—interact, in complex ways, for long periods; and every later characteristic is a long deferred and indirect product of this interaction.

"The genes, then, are simply chemicals that enter into a great number of complex reactions, the final upshot of which is to produce the completed body. The characteristics of the adult are no more present in the germ cells than are those of an automobile in the metallic ores out of which it is ultimately manufactured. To get the complete, normally acting organism the proper materials are essential; but equally essential is it that they should interact properly with each other and with other things. *And the way they interact and what they produce depends on the conditions.*"

The results of many recent biological experiments tend to support this view. Such experiments are Loeb's experiments on the development of the ovum, experiments which show that if, after the first division of the egg, the two cells are separated what normally becomes the right and left of one organism becomes two organisms, experiments which show clearly that, if transplantation of tissue take place early enough, the transplanted tissue has its development and function modified by the nature of the tissue in which it is developed, experiments that show the amazing influence of vitamins and endocrine secretions. A great and increasing mass of modern work seems to tell the same story: there is no gap and no antagonism between heredity and environment, between nature and nurture.

Thus Jennings⁽¹⁷⁾ writes: "In fish, for example, two eyes, one at each side of the middle line, form as distinctly an inherited characteristic as in man, yet fish can be subjected so early to changed conditions (as Stockard and others show) that the animal has a single median eye instead of two lateral ones; and many other equally striking changes are producible by changes in the chemical environment. If the fish lived continuously in these conditions they would regularly inherit a single median eye; the lateral eyes would be looked upon as a rare abnormality, produced by special conditions and not inherited. In truth all characters are as certainly due to the conditions of development as the materials of the germ cells." And again: "Any of the great investigations in genetics—that of Morgan on *Drosophila* or that of Emerson on maize—reveals hundreds of cases of the alteration of characteristics by changes in environment. No result of genetic science is more certain than this."

Though I have found no other writer who states the case so clearly and definitely as Jennings yet it is not difficult to discover in the biological literature of the day support for the general position here outlined, *videlicet* that the old connotations of the terms heredity and environment which have been antithetical and mutually exclusive, must now be modified in

such a way that we can conceive them as but two aspects of one and the same process. Let me support the statement of Jennings by brief quotations from other authorities.

Dendy,⁽¹⁸⁾ the biologist, writes: "It seems possible then that we are to be allowed once more to believe in the permanent effects of individual effort in improving the human race through the process of heredity. Lamarck may be permitted to come out of his corner, and we may all take a more hopeful view of the future. We must not, however, be too sanguine, for we have always got the germ cells to reckon with, for good or evil, and it is evident that they are extremely conservative bodies. Usually, at any rate, they respond very slowly to changes in the environment and refuse to be influenced by merely temporary emergencies."

E. W. MacBride⁽¹⁹⁾ says: "The reader will thus observe that a great mass of careful scientific experiment has been accumulated which demonstrates the inheritability of the effects of habit. When this mass of evidence has had time to penetrate the scientific world and be appreciated at its proper value it will revolutionize many of the current ideas on heredity."

From "The Evolution of Man," by G. Elliot Smith,⁽²⁰⁾ many quotations to a similar effect might be made.

It seems fair to say, then, that to-day biology is escaping from the thralldom of the concepts, heredity and environment; that some leading biologists are realizing that the problem is advancing to another plane on which these terms must have, not an exclusive, but a complementary reference and that the actual factors work in the closest possible interaction. The problem is no longer what it was for Spencer; the modern problem is what are the factors, environmental or hereditary, that do affect development and how can man control them?

V.

If we turn to the psychological field we find a similar waste of effort in antagonisms arising out of the conception of terms which indicate forces that are not exclusive but complementary. Consider, for instance, the lost effort of the dualists and the monists in their struggle over mind and body. The older dualists like Descartes saved the possibility of social change by affirming that though causal necessity was bound up with the bodily frame, man, being the possessor of a soul, could direct his own course. The great difficulties of this view were made manifest by the successors of Descartes. Thereupon arose the sharply opposed views of vitalism and mechanism that later it was hoped the continuity inherent in

the evolutionary doctrine would combine. But the very terms "body and mind" have prevented many from seeing the unity of the organism, a word that in this connection must clearly cover those functions that are typically mental in the body-mind system, and the whole tendency of modern advance is to show the closeness of the relation between what had been conceived as in violent antithesis: mind *versus* body. "We cannot," says J. S. Haldane,⁽²¹⁾ "start from the unfounded supposition that there are separate things called minds, associated with other separate things called physical bodies." Even in its old form it would not be true to say that this opposition has passed away; the very terms bind many who desire to free themselves from these chains of the past. It is also true, too, that the same problem has been raised in an adjacent field. Body, governed by physical or bio-chemical laws, was the world of necessity; mind, not governed by these laws, was the field of possibility and freedom. In the psychological domain this antagonism appeared in the form of the contrast of instinct and intelligence. It is but the old problem of heredity and environment in another guise. Are we chained or is there some possibility of freedom? This opposition in psychology is clearly shown in a comparison of the views of two prominent men, McDougall and Dewey.

Psychology, and more especially the social implications and applications of psychology, were given a new direction when McDougall stated his view of instinct in his *Social Psychology* and indicated the significance of this conception for social life. The instinct, as a psycho-physical disposition, may be modified in its motor and sensory aspects, but yet is the moving force in mental life, and, within certain limits and under certain conditions, is the real determinant of action. If all the drives in man are instinctive it seems to imply that man is a very complicated machine, the mechanism of which is touched off in definite ways by different types of situations or environments because of the nature of the psycho-physical structure that has been inherited by the organism. It is the peculiarity of McDougall's psychology that his view of instinct is not to be mechanistic, but is to be based on hormism. It is no accident that the difficulties in connection with the bases of his psychology are most clearly seen in his work "Body and Mind."

On the other hand, Dewey is all for impulse fashioned by habit. Man is overflowing with energy, but the precise direction the energy will take and the specific form it will assume will, in any case, depend almost entirely on the nature of the environment—the physical world, the social heritage and the past experience of the individual in so far

as these have given rise to habits. Dewey, therefore, insists on the plasticity of the impulses; they are possibilities or potentialities that are given different forms by the environment in which they receive body and actuality. Impulses are native stock; what we want to know is how the native stock has been modified by interaction with its environment. For Dewey, then, there are no native, canalized streams of energy like McDougall's instincts; in his view McDougall's instincts are some of the forms that the impulses assume under the stresses of custom. "We realize," he says,⁽²²⁾ "how little the progress of man has been the product of intelligent guidance, how largely it has been a by-product of accidental upheavals, even though by an apologetic interest in behalf of some privileged institution we later transmute chance into providence. We have depended upon the clash of war, the stress of revolution, the emergence of heroic individuals, the impact of migrations generated by war and famine, the incoming of the barbarians, to change established institutions. Instead of constantly utilizing unused impulse to effect continuous reconstruction we have waited till an accumulation of stresses suddenly breaks through the dykes of custom."

What has been said in reference to the biological field applies here also; it is unscientific to set these two groups of factors over against each other as if mankind were limited to the necessity of choosing one set or the other. Watson's experiments on the first reactions of infants seem to indicate clearly enough that much of what was in the past considered instinctive must now be held to be due to the early fashioning of impulse by the conditions of its exercise. The importance attached by Freud to the earliest impressions of life points in the same direction, and these experiments and theoretical deductions have received support from the experience of those who have tried out these views in the development of children under new methods of education. There is, however, a point that ought to be stressed because it bears directly on this question. One of the most striking differences between man and the lower animals, between the more civilized races of men and the savage races of men, is the ability to fashion the environment. The lower animals and even the lowest races of men have shown little ability to adapt their environments to meet their needs; they have been compelled, to a greater or less extent, to bring their needs into line with the environment or perish. Our superiority consists mainly in our power to control and modify the environment to suit our needs. The higher the stage of development the greater the power to mould the environment and consequently the relatively more important does the environment become in the

development of life. Up to the present man has but made a beginning in a great movement of evolution that is becoming conscious of itself. As far as the physical environment is concerned man's success in the last hundred years has been startling. What most people call civilization—cities, aeroplanes, steam engines, battleships, books—is the result. But we are beginning to realize that there is an environment that has been neglected—man himself. This environment must be understood, not only because, as man advances, the social environment becomes of increasing importance, but because the direction of all forces, physical and social alike, depends on man's understanding of them and power to control them.

VI.

The sociological importance of these different "psychologies" is due to the very different attitudes they encourage towards the facts and problems of life. For McDougall, with his conception of human nature canalized by definite instincts, there is little prospect of altering things for the better except by developing gradually, by selective breeding, those who have the better type of instincts thoroughly systematized. The social implications of his theory of instinct McDougall⁽²³⁾ has worked out in "National Welfare and National Decay" and "Ethics and Some Modern World Problems." The refrain of each book is the same. The progress of the world is dependent upon its leaders; civilization depends on its great men. Modern civilization is weakening because of the sterility of the classes, the fecundity of the masses, and the influence of the social ladder whereby promising material of the masses finds its way into the classes. The hope of the world is in eugenics. We are not now producing enough of the superior type to fill the many positions of light and leading that modern civilization demands.

"Civilizations decay because they die off at the top; because, as they become increasingly complex, they cease to produce in sufficient numbers men and women of the intellectual calibre needed for their support. So long as a nation produces in each generation a fair number of persons of first rate calibre, it can carry an enormous tail without fatal decline. But the number of such persons tends to become not only relatively but also absolutely fewer with each generation; because civilized nations breed from the bottom and die off at the top. . . . Civilization, by reason of its increasing complexity, is making constantly increasing demands upon the qualities of its bearers; the qualities of these bearers are diminishing or deteriorating rather than improving."

That there is an element of truth in this statement few will deny. It seems, however, to emphasize unduly the aspect of heredity and to overlook important factors in the environment. Might not man do better by seeking a different type of material environment and a better system of social organization? Further, McDougall appears to assume that in the past the world's leaders were the best available. Is there any real evidence for this? Have those the world followed, by desire or by force, been any better than, or even as good as, many others under whose direction it might have come if these latter had had more power or the people had had more insight? Ritchie it is, I think, who calls on us to realize that there are two classes of people who break with social traditions and conventions—the malefactors and the reformers. How often has society crucified the reformer between the malefactors? How often has it crucified the reformer and placed the malefactor in the seat of the mighty? But whatever may have been the case under earlier types of organization it is clear that the selection of leaders to-day depends almost wholly on the kind of people who elect. Merely to breed a superior type of man is not sufficient; as in the past he may find himself on the cross rather than on the throne.

In a similar manner use has been made of the first results of intelligence tests. The I.Q. has been accepted by some as a measure of native ability as certain and as definite as the pound or the yard. Even McDougall bases a good deal of his reasoning on the results of the American Army Tests. But already there is accumulating evidence which shows that the purely native intelligence, if there is any such thing, cannot be separated from acquired ability and tested independently of it. This does not mean that we must throw over the intelligence tests that have proved of great practical benefit, but only that we must not make absurd claims for them nor use them without a clear understanding of their limitations. They constitute another method by which light is thrown on the nature of intelligence; they do not displace other methods but supplement them.

Of course, it is possible to take the view that democracy, or in McDougall's language, ultra-democracy, is a mistake and that we must get back to some form of autocracy if our civilization is to survive. Bagley⁽²⁴⁾ has dealt with this point. "It is salutary," he writes, "to look the problem thus squarely in the face. If the determinist is right, the ideal of democracy is wrong; the forces that have resulted in a democratic order are forces of social involution and not of social evolution; the educational aims and ideals that have gone hand in hand with the ideal of insuring a certain kind of equality among human

kind, are a tragic, even ghastly, mistake. The determinist talks loudly and frequently about wanting the truth. If he is right, this is the truth and he should not try to evade it." We must try to prevent ourselves from being blinded by words. Democracy is only at the beginning of its trial. It may or may not be good; it may or may not succeed. It certainly will not do so without our effort; at our level of development progress does not simply happen, we must plan it. If democracy does not succeed it will probably require a revolution unlike any that the world has seen, before man reverts to a permanently autocratic régime. It may mean that development upon our line will cease and another section of humanity will find sympodially some other solution of our social difficulties.

So impressed was Huxley⁽²⁵⁾ by the older interpretation of the facts that he came to the conclusion that cosmic forces and moral endeavour must be eternally antagonistic. "Let us understand, once for all, that the ethical progress of society depends, not in imitating the cosmic process, still less in running away from it, but in combating it." McDougall admits that this lecture by Huxley gave him a severe moral shock, followed by a profound depression. That is obvious enough; "Ethics and Moral World Problems" is the attempt to escape from the dilemma. There is, of course, the modern form of Huxley's conflict; the belief that betterment for the individual means deterioration for the race. This is the doctrine of selective environmental elimination which implies that progress in civilization causes racial degeneration. Is this but a modern scientific form of Rousseau's theory? This view is accepted by some eugenicists and by many militarists.

"Humanity can have a sound and robust constitution only through living in filth, disease, vice and violence. These weed out the defective germs, leaving the vigorous and capable."

But should we to-day be worried by Huxley's bogey? Surely the evolution of a moral system among men is just as much a fact as the evolution of backbones among animals. It is true that neither the moral system nor the vertebrate form may last for ever. The conception that there can be a fundamental antagonism between cosmic forces and man's moral system is due to a false antithesis, arising from a false opposition in our concepts. It may be, of course, that the universe is indifferent to man's moral values but that does not mean that these moral values are of no importance for man. On the other hand, there are some who favour the other term of the antithesis, who neglect the importance of hereditary influences and oppose any steps that may be suggested for improving the race by eugenic means. This conception gives

rise to an unduly optimistic view of the possibility of the immediate improvement of society. Arising from the dominance of these concepts we have two extreme attitudes to social progress. If the environment is little or nothing and heredity is everything then the outlook is black. It means that man must await the course of evolution; nothing that he can do, except in the way of eugenics, will make any difference in the course of events. This reaction to social life is seen in the attitude of the ultra-conservative who bases all his theory and practice on the maxim that human nature does not change, that is, change rapidly enough to become a factor of importance in the situation. It is tragi-comic, yet reasonable enough, that the "dyed in the wool" conservative and the extreme Marxian (with his gospel of the materialistic interpretation of history) find themselves in the same boat. But while one believes that the boat will never leave the sea of things as they are, the latter is inspired by the hope that, with the mere turn of the tide, the boat will be carried high and dry on to the delectable shore of proletarian communism. I fear they will both suffer disappointment. But the pessimistic view that human nature does not change and the optimistic one that it may be changed over-night by a successful revolution are equally false. That we may solve our great social problems by separating the subjective and objective factors and by attending to one but not the other seems impossible. We have passed the point when we could say with Buckle,⁽²⁶⁾ "Whatever the moral and intellectual progress of man may be it resolves itself into the progress, if I may say so, of opportunity, that is, improvement in the circumstances under which the capacity after birth comes into play. Here is the gist of the whole matter. The progress is one not of internal power but of external advantage." Whether it be in the international world, the social world, the economic world, the moral world, we must realize that the scientist cannot afford to apply the telescope to either eye that happens in his case to be blind.

It seems to me that in all fields investigators are turning away from these false and barren antitheses and that the great task of the coming generation is to make the new ideas fertile in the solution of those grave social antagonisms that are based on conceptual constructions falsely opposed. In the older view the influence of the environment was stressed in the doctrine of the perfectibility of man, but the bearing of heredity on social problems was overlooked. In more recent times the boot has been on the other foot; most enquirers have seen no hope except in the gradual changes that breeding can produce. In both cases the wish is father to the thought.

In every sphere this opposition has to be swept away. "The two evils are: one, the ignoring of the true relation of each organism to its environment; and the other, the habit of ignoring the intrinsic worth of the environment which must be allowed its weight in any consideration of final ends" (Whitehead).⁽²⁷⁾ I believe that this desirable end can be forwarded by a wide diffusion of the general results of modern psychological research, principles which, if they can find a place in the popular mind, will do much to save us from the evils that either, or both, of the one-sided views may at any moment bring upon us. It appears to me that among these results of modern psychological work we may include the following:

1. That all mental phenomena are natural; they must be considered as natural processes, not magical or supernatural ones.
2. That we are much biassed by our emotions and desires, and our judgments tend therefore to be clouded and distorted by prejudices.
3. That intelligence and reason are of supreme importance in the ordering of life but that in the face of the emotions they are relatively weak.
4. That in this respect knowledge is power; reason may be greatly strengthened by a clear recognition of the influences that are at work.
5. That the great obstacle to the development of a personality or unity, individual or social, is conflict; that conflict gives rise to unconscious repressions that must be dragged to light if human personality is to develop to its full possibilities.
6. That around these conflicts and repressions a great deal of humbug has collected, giving itself a rational guise under the shelter of terms that indicate frequently our wishes in the form of slogans and party battle-cries.

If these fundamental principles were once assimilated by the people it would be equally impossible to have on the one hand a gloomy pessimism that paralyses action and thought or on the other hand an easy optimism that, believing God (or Marx) is in his heaven all's right with the world, imagines that no effort is necessary or that by the mere pass of the magic wand of revolution all may be perfect to-morrow.

VII.

A brief reference to one or two of the great questions of the day will, I believe, justify the viewpoint of this paper.

The International Problem.—Here we have on the one hand those who claim that each nation or race is a unique unity that must fight economically, intellectually and, if necessary, militarily, any nation that crosses its path, or, as it is usually called, its destiny. On the other hand, we find those who think there is no problem; if only the environment were changed all would be well and the lion would lie down with the lamb. Neither of these views seems to be sound: one attaches too much importance to heredity and is unduly pessimistic as to what can be achieved by a thoroughly impartial and scientific investigation into the grounds of conflict; the other does not realize the power of heredity and the weight of the social heritage in human action. It is unduly optimistic and is not, therefore, prepared to make the effort to explore thoroughly the causes of international antagonisms. One of the best pieces of work that could be done by the League of Nations would be an investigation into the mental make-ups of the great nations of the world. If people are to co-operate they must understand. This is brought to mind in an arresting manner by the great evil of international life-war. Here we find naturally enough the hereditarians, those who believe that man has a pugnacious instinct and that war, therefore, is inevitable. War is a psychological necessity. Even William James, in his celebrated essays on this subject, accepts in some measure this view, though he realizes that the energy of the so-called instinct of pugnacity may be sublimated along constructive lines in the immemorial struggle of man with nature. Some speak of the biological necessity of war, meaning that it is by war that nations are purged of their weak members and are redeemed from softness and flabbiness. Still others consider that war is sociologically necessary, for by no other means can men be compelled to co-operate and by this means only can the stronger nations be given the position of leadership their superiority warrants.

But against this view of the position of war in human life many lines of evidence are developing. War as a biological necessity, as a means of keeping population within limits and of preserving the best strains, stands condemned to-day. Even if it were true that under more primitive conditions war performed these functions, it is no longer so. Malthus, whose work on population stimulated those inquiries that led to the modern evolutionary theory, saw clearly enough that war and famine were methods that came into operation when man's control failed. But since the day of Malthus scientific knowledge of the conditions of reproduction has so increased that man has now within his power the means by which to adapt population to the economic and spiritual needs of man-

kind. It remains to be seen whether he will rise to the occasion. In any case modern warfare is no alternative; it is destructive of the best human elements and productive of the worst type of social heritage. The psychological argument for war will no longer bear investigation. Even if we admit McDougall's scheme of instincts we find that pugnacity is peculiar in having no specific object which excites it, but that it is brought into action whenever any other instinctive tendency is thwarted. If man must fight then there are many objects other than his fellow-men against which he may direct his energies: the conquest of nature, of disease, of war itself. One of the very best instances of the re-direction of the instinct of pugnacity is to be found in the very antithesis of war—a system of justice. For if war can be traced back to a pugnacious instinct so also can our judicial system, in which man's anger has become, or is becoming, sublimated into righteous indignation and in which no man is judge in his own cause. War as a means of sociological progress has been wholly discredited by the work of the leaders of the newer school of ethnologists which has accumulated a great deal of evidence that all goes to prove that war did not occur among primitive peoples; indeed, as Plato suspected long ago, war did not appear till there was plunder to be won by fighting. This applies apparently both to the primitive races that have died out and to those of which we have direct experience. Thus W. J. Perry,⁽²⁸⁾ writing of the dead past, says: "With their arrival on the scene the period of real warfare set in, and a world that had previously been occupied with the arts of peace, became the scene of incessant strife, the result of which was to reduce many of the great civilizations to ruin and decay. That is the solution of the problem of the decay of civilizations." And of the present he writes: "When inquiry is made at the beginning, when the food-gatherers of the earth are examined, a remarkable result follows. Instead of spending their days fighting, these people, one and all, live peaceful lives when left undisturbed. They use no violence in their personal relations, and they do not fight as communities. The unanimity with which men and women who have lived among such peoples, and know them well, testify to their honesty, their fidelity to the marriage tie, their kind treatment of children, their respect for the old, and their peaceful behaviour in all their relationships, is one of the most striking phenomena of ethnology."

If these views be true it becomes a question of education and organization to ensure that an outlet socially useful shall be found for this specific energy of men. The hereditarian it seems puts the telescope to his blind eye before which lie all

those conditions, racial, political, historical and (in our day especially) economic, that breed wars.

On the other hand, their opponents who argue, and wish to act, as if war could be ended to-morrow, fail to realize the depth of man's nature, his long history, and the nature of his social heritage. If one could re-plan Europe afresh on a racial basis without any feeling of *revanche*, the outlook would be more hopeful. This cannot be done. We have to deal with peoples who in many ways differ in nature and who have a history—their victories and defeats, their glories and shames. So, as James tells us, the war against war is going to be no camping party. But a realization by the mass of men of the economic and psychological causes of war, a re-valuation of national glory and shame, and an emphasis on human rather than on national history are first steps on this path. The hidden motives must be dragged to light and seen to be what they are in their pure nakedness, stripped of all those trappings of gilt, glory and patriotism, with which a more ignorant and less humane people have bedecked them. People must be made to realize that war is the destroyer of civilization. "The possibility of world peace, founded on world purpose," says Graham Wallas,⁽²⁹⁾ depends mainly on our ability to calculate the effects of world-war and to derive a sufficiently powerful impulse from our calculations."

If we turn to social affairs we find a similar antagonism, seen in its most acute form to-day in the problem of capital and labour. One school believes that the social castes that exist to-day are based on the fundamental native differences of the people who are found in them; that the coloured races are by nature designed to fetch and carry for the white man, that the lower orders of society have their sole purpose in contributing to the welfare of the higher who are the bearers of culture. Primitive Christianity, it is true, was quite opposed to this caste system, and Tawney has shown us how the Church deserted its high mission and used its best efforts to find reasons for supporting the social class that it found in power. So to-day among Christian peoples we find a large body of opinion of the most dogmatic type, supported by emotions of the most fervid character, which is certain that the divisions that exist in the social classes are the inevitable results of the nature of the people who compose them. Even to-day Dean Inge can write: "There is nothing in our institutions to give us an uneasy conscience; our troubles are due, as Robert Browning says, to 'the corruption of man's heart'." It follows that every effort to upset this order in society is to run counter to natural forces and to invite disaster. Even McDougall⁽³⁰⁾ believes that in England "the operation of the

social ladder tends to concentrate the valuable qualities in the upper strata and to leave the lower strata depleted of the finer qualities." This school grossly under-estimates the influence of the environment. Success in life in modern communities depends much more on chance than the members of this school seem to realize. Anyone familiar with some of the well-planned schemes for dealing with the young wreckage of the human race—The George Junior Republic and similar institutions—knows well enough the tremendous power of a good environment. The conditions may bring out or suppress the qualities that make for good citizenship. There is a great truth in Van Loon's⁽³¹⁾ statement that "Rembrandt would not have painted pictures, Bach would not have composed fugues, Praxiteles would not have made statues, if they had been born in an igloo near Upernivik and had been obliged to spend most of their waking hours watching a seal-hole in an ice-field." On the other hand there are those who believe that all the difficulties of social relations arise from the conditions of life; that one man is natively as good as another and if all men were given an equal chance all would be equally successful. But no one familiar with the facts, so fully reported in the literature of this subject, can fail to understand that at the present time there are born into this world thousands who are so tainted in their heredity that it is impossible to enable them to play an independent and useful part in our complex social life. No one ought to deny that factors of heredity are important and that every effort should be made to insure for the child, as far as possible, not only the best environment, but also the best heredity. These should be conceived neither as opposites nor as alternatives. They are complementaries, they are two sets of factors in the development of the best human race. No mere stroke of the pen, no mere revolution, no mere changing of our masters, will perfect human society. On the other hand, what the individual can achieve depends very largely on the conditions of his growth. While then we should make every effort to stop the stream of those whose heredity is defective, we ought to strain every nerve to insure that every child is given the best environment in which to develop its potentialities. Instead of hurling defiance at each other these two armies must meet to study the problems and to work out a plan for a successful campaign against the real enemy—*ignorance of the nature of man and of his social relations*. We shall then find that the problem of industry cannot be decided merely in terms of wages and hours of work; personality and human values must be considered as well as material ones. With this knowledge and attitude of mind the economic problem, capital and labour, is seen to be one of social organization.

It is clear that our psychological knowledge is now reaching the stage when it may become effective in social effort. Many are coming to realize this and to sense the problem that man has to solve. Men have too long been staring into things physical; the solution is not there. Man must see that it is through knowledge of his own nature that the solution can be reached. Again the kingdom of heaven and earth is within. The hopeful sign is that on all sides thinkers and doers are beginning to attack their problems in this spirit.

"The world is now faced," says Whitehead,⁽³²⁾ "with a self-evolving system which it cannot stop. There are dangers and advantages in this situation. It is obvious that the gain in material power affords opportunity for social betterment. If mankind can rise to the occasion, there lies in front a golden age of beneficent creativeness. But material power in itself is ethically neutral. It can equally well work in the wrong direction. . . . The materialistic philosophy emphasized the given quantity of material and hence derivatively the given nature of the environment. It thus operated most unfortunately on the social conscience of mankind. For it directed almost exclusive attention to the aspect of struggle for existence in a fixed environment. . . .

"During the last three generations the exclusive direction of attention to this aspect of things has been a disaster of the first magnitude. The watchwords of the 19th century have been struggle for existence, competition, class warfare, commercial antagonism between nations, military warfare. The struggle for existence has been construed into the gospel of hate. The full conclusion to be drawn from a philosophy of evolution is fortunately of a more balanced character. Successful organisms modify their environment. Those organisms are successful which modify their environments so as to assist each other. This law is exemplified in nature on a vast scale."

This change in our concepts carries with it great potentiality for progress in social affairs. It is worth the effort to bring it about. Even in our day the conceptions of science invade but slowly the thought and action of the leaders in any community, not to mention the mass of the people. The ideas they hold and the actions motivated by them lag far behind the scientific opinion of the day. This is one of the great dangers of an age in which scientific thought is developing rapidly. "Only by sustained continuous intellectual effort can we keep abreast of our science and its ensuing power over our lives. If we stop for ever so brief a time dynamic science will leap ahead of our comprehension" (Lindeman).⁽³³⁾

This is especially true of social science. Lack of knowledge of chemical principles may be made good by the work of experts, but ignorance of the true principles of social relations among the members of a community bears its fruit in due season. The blood on the altars of the ignorant is the blood of the ignorant. Every wise community should be taking steps to insure the widest possible diffusion of sociological knowledge. The educational effort of the past fifty years has centred round the child; the educational effort of the next fifty years will centre round the adult. In view of the increasing importance of the psychological factors, old agencies must be stimulated and new agencies created by which these new discoveries may become an integral part of the thought and action of the good citizen. This wide diffusion of sound psychological knowledge is the more necessary because already anti-social agencies have seen that this knowledge may be used to forward their selfish interests. "But while men," says Graham Wallas,⁽³⁴⁾ "are normally unaware of the process by which the idea of their nation and its accompanying emotions are produced, the practical skill of those whose business is the large scale creation of such ideas and emotions is continually increasing. . . . The manufacturers of cinema films, though their own object be nothing but the accumulation of money, are creating for the now growing generation of mankind an imaged world in which, against a background of Californian valleys and Chicago drawing-rooms, second rate actors prove that luck and coincidence will always help vulgar motives to vulgar success."

In every direction to-day we see the slogan displacing thought, and propaganda, education. People, therefore, need the truth on these subjects both as a tool of social re-construction and as a weapon of social defence. I believe that one of the greatest services that our Association and its Journal can render to the civilization of these Southern Seas is to use its earnest endeavour to insure that the new ideas shall be assisted in their permeation of the minds of our people so that they may re-issue in successful social action.

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NOTES BY THE WAY.

II.

"There is a certain falsely abstract way of imagining the relation between a thought and its predecessor; an error closely connected with the false view of educational progress. It consists in thinking of this relation as if a mind in its early years acquired a precise knowledge of all that had been hitherto accomplished, and then proceeded to criticize, correct, supplement, on the strength of this firmly-established position. But actual development takes place in a quite different manner. It begins, one might almost say, not by understanding but by misunderstanding, or not only by understanding but also by failing to understand. The spirit achieves its progress by solving new problems, different from those which once occupied men's thoughts; and among the new problems is the work of these earlier men themselves, which at first stands over against the spirit of to-day as a 'thing-in-itself,' that is, nothing, and then by degrees enters into it and forms part of it, as a problem to be solved. Hence, to understand one's predecessors and to progress beyond them are not two distinct phases but one and the same phase, not two processes but a single process." (*Benedetto Croce: An Autobiography.*)

MAORI CULTURE AND MODERN ETHNOLOGY: A PRELIMINARY SURVEY, II.

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III.

TE RANGI HIROA, in his recent monograph "The Evolution of Maori Clothing," has suggested that, faced with the opposing theories of diffusion and independent origin, Maori clothing offers a useful field for study. His conclusion is that "from the available data it would seem that both diffusion and evolution have played their part, but the honours are with the latter." Undoubtedly the new and changed environment of these islands led to certain divergences in the culture of the migrants from Central Polynesia. It has often been pointed out that the colder climate demanded warm garments which were manufactured from dogskin and the local flax. The paper mulberry, from whose bark the Central Polynesians made their clothing, did not flourish in New Zealand: nor did all of their food plants. More substantial types of houses were needed and these too were local modifications. Thus it might be argued that the other divergences of Maori culture from that of Central Polynesia had also taken place in response to the demands of the changed environment. Linton, for example, suggests that the abundance of fine hardwoods in New Zealand led to a remarkable development of wood-carving and to the almost complete abandonment of stone construction. But this method of explanation, ignoring as it does the whole question of a people and a culture already present in the country when the Maori came, is certainly too simple to account for all the facts. In the literature of Maori ethnology one cannot fail to observe a tendency to be content with oversimplified and superficial explanations often of an exclusively local nature. The environmental conditions of different island groups in the Pacific are broadly similar and, as Skinner has pointed out, in the Pacific the culture of a migrating people has, for the most part, dominated the factor of environment in the new home. Dixon's study of the racial history of the Oceanic area has led him to the view that a succession of waves of fundamental or derived types spread from west to east throughout the whole region, and it is on this principle that he has offered his theory to account

for the undoubted racial complexity of the Polynesians. Similarly, there can be little doubt that it is to the idea of successive waves of culture and their blending and modification that we must look for an explanation of the cultural diversities of the Polynesians. This principle, combined with the immensely important principle of cultural degradation, will explain much.

As has already been mentioned, the Maori people, like other Polynesians, possessed many traditions of their origins and wanderings and in ethnological studies these traditions have played an important part. The question of their reliability and of the interpretation to be placed upon them must therefore be discussed. How far are they to be regarded as history? Some early students of the Maori were inclined to place very little weight upon them as historical evidence. Colenso, for example, in discussing the date of the arrival in New Zealand of the immigrant ancestors of the Maori says: "Little really valuable, of a positive nature, can be gathered from their traditions. The writer well knows how cleverly the different tribes of New Zealanders contrive to deduce their descent from one of those early (mythical) immigrants, although in so doing they diametrically oppose each other in their early genealogies." As regards place of origin Colenso interpreted mythically the *Hawaiki* of many traditions and so spoke of the "immigration myth" and of the arrival of the canoes as a "mythical rhapsody." He found the legends of migrations full of marvellous incidents. The analysis of evidence drawn from many sources led him to believe that the "time of the early or first peopling of New Zealand is one of high antiquity," and "while the fair Polynesian race everywhere exhibits signs of great antiquity, it also bears unequivocal symptoms of great and rapid decadence, or universal deterioration and decline." Hochstetter took much the same view and agreed with Schirren that there was no historical truth in the traditions. They were simply versions of the famous *Maui* myth. In more recent investigations we find a great change of attitude; though it may be doubted whether the complex relation of myth and history has even yet been fully appreciated. Unquestionably the value of tradition was unduly discounted by earlier writers; but there now seems to exist a danger of going to the opposite extreme. S. Percy Smith, and more recently Te Rangi Hiroa, have argued strongly for the value of tradition. "I would like to say," wrote Percy Smith, "that in my humble opinion the European ethnologist is frequently too apt to discredit tradition. It is an axiom that all tradition is based on fact; whilst the details may be wrong, the main stem is generally right. In this, local colouring is one of the chief things to

guard against, and here the European ethnologist is generally at fault for want of local knowledge—at any rate when he deals with Polynesian traditions. No one who has for many years been in the habit of collecting traditions from the natives themselves, in their own language, and as given by word of mouth or written by themselves, can doubt the general authenticity of the matters communicated. But it is necessary to go to the right source to obtain valuable information. . . . The men who really know the traditions of their race look upon them as treasures which are not to be communicated to everybody. They will not impart their knowledge except to those whom they know and respect, and then very frequently only under the conditions that no use is to be made of them until the reciter has passed away. Much of the old history of the Polynesians was looked upon as *tapu* (sacred) and its communication to those who could not share this feeling, or who would make improper use of it, would inevitably—in the belief of the old *tohungas* (priests)—bring down disaster on the heads of the reciters.” It is suggested, too, that we tend to underestimate the detailed powers of memory possessed by a people who did not keep written records and whose imagination was checked by fear of the divine wrath which would follow any deviations from the accepted teaching. Te Rangi Hiroa has stressed further the pride which the Polynesians took in their traditional history, and points out that it was not known to all nor popularly discussed, but transmitted from generation to generation of scholars in the *Whare Wananga* or Sacred Houses of Learning.

On the basis of the traditions and of the genealogies which they contain, S. Percy Smith endeavoured in his “Hawaiki” to reconstruct a history of the Polynesians and their migrations which he later briefly summarized as follows. The Polynesians are Caucasians, though with other racial mixtures, and are a branch of the Proto-Aryan race of India. They left Northern India about the commencement of the fourth century B.C. They passed to the East to Indonesia, occupying Sumatra, Java, Borneo and the Celebes. From Indonesia one migration reached Hawaii directly; others passed along the northern coast of New Guinea, and the Solomon and New Hebrides groups, settling in the Lau group of Fiji, Samoa and Tonga. From Samoa and adjacent islands they spread to Eastern Polynesia somewhere about 700-900 A.D. New Zealand was discovered by Kupe the navigator about 925 and settled by Western Melanesian-Polynesians shortly afterwards; but by the Polynesian Toi-te-huatahi from the East Pacific about 1150 and finally by the fleet of canoes bringing the main body of Maori immigrants in 1350. Te Rangi Hiroa

in his Cawthron Lecture, "The Coming of the Maori," has divided the settlement of New Zealand into three periods:

1. The pre-Toi settlement occurring a fairly long time before 1150 A.D.

2. The Toi expedition of 1150 with the accession of a number of less well-known canoes preceding the fleet.

3. The *Hawaiki* migration of 1350, composed of the fleet of five vessels with other well-known canoes of the same period.

In considering Percy Smith's historical reconstruction and chronology the question must be raised as to whether he does not rely too much on the genealogies. This whole subject is carefully discussed by Williamson in his "Social and Political Systems of Central Polynesia." Williamson points out that even when the shorter tables of different branches of the Polynesians are compared and disclose descent from a common ancestor there is still room for doubt as to the length of time which they all may have covered; and a further important point is added. "I have," says Williamson, "rightly or wrongly arrived at the suspicion that some of the very long family histories and genealogies of great Polynesian chiefs have been more or less doctored and lengthened out, and in parts probably even invented, for the purpose of supporting competitive contentions of superiority in length of ancestry and sometimes in divine origin, and if this suspicion is justified it adds another element of uncertainty as to the trustworthiness of genealogies in measuring records of time." As regards Maori genealogies it seems certain that the Maori himself did not look upon them as genealogies in our sense. After a certain number of generations of historical persons many of them pass into personifications of the natural phenomena of the Maori cosmogony. Further, in regard to the peopling of New Zealand there has been at work a motive which is certainly not confined to the Maori, namely a desire to trace descent to a famous migration which carried with it *mana* and prestige. On this point Campbell asks: "How much of the blood of the present native inhabitants of New Zealand is derived from the people who lived here before the arrival of the historical canoes, and how much from the conquering canoe-men? At present, almost every Maori in New Zealand, except the Urewera tribe, claim to have none but the bluest of blue blood, and quite deny any *tangata whenua* (aboriginal) admixture. . . . I think that probably most of the Maoris have more or less of the blood of those who came in the canoes, but that by far the greater portion is derived from those who preceded the canoes by many generations." There was in the Maori mind a strong sentiment regarding descent. The Maori desired to possess a stainless pedigree and descent

from the conquered *tangata whenua* carried with it the stain of servitude. Ancestry other than that of the *Hawaiki* migration was thus concealed in genealogies and the very existence of an earlier population more or less ignored. Human motives are strangely uniform and "coming over with the canoes" was the Maori equivalent of "coming over with the Conqueror" and "coming over with the Mayflower."

Among later New Zealand ethnologists Tregear and Skinner are unable to attribute to Polynesian traditions and genealogies that value as historical evidence which Percy Smith gave to them. Tregear in "The Maori Race" shows that the historical and the mythical melt together and are almost inseparable. Rivers discussed this subject in his address on "The Peopling of Polynesia" and pointed out that it is a general rule in human tradition that it is the recent which especially attracts attention. "Our own history," he says, "gives us the clue to a feature of folk-memory which goes far to explain the excessive weight laid by Polynesian tradition upon a feature of their history which was only the last of a series of invasions and blendings. Moreover, it is probable that the movements thus recorded in the memories of the people are not even those of the incoming of the latest of the main streams of immigration into Polynesia, but are rather records of secondary movements within the Pacific, which were perhaps the reverberations of disturbances set up in the Malay Archipelago at this time by the Hindu invasion to which are due the great temples of Java and many other signs of Hindu influence." Lack of knowledge by the present-day Polynesians of the remarkable stone monuments of Easter Island and other places seemed to Rivers a strong argument against regarding their migration traditions as historical. In arguing against the comparative recency of the peopling of Polynesia, as he says, we cannot have it both ways. If the memories of the Polynesians were so good that they carried in their minds for seven hundred years minute details of ancestry and migrations, why should they have wholly forgotten the building and the meaning of these monuments if they are contemporaneous? Malinowski's recent study of the rôle of myth in primitive life here suggests some illuminating new ideas regarding myths and traditions. In keeping with his functional view of culture in general Malinowski's main point in his "Myth in Primitive Psychology" is the pragmatic value of myth in human life. Studied in its life-context it is seen to be neither a rhapsodic rendering of natural phenomena, nor a kind of primitive science, nor yet a mere chronicle of the past, but "an indispensable ingredient of all culture. It is constantly regenerated; every historical change creates its mythology, which is, however, but indirectly

related to historical fact. Myth is a constant by-product of living faith, which is in need of miracles; of sociological status, which demands precedent; of moral rule which requires sanction." Regarding the relation of myth to history Malinowski says further: "The historical consideration of myth is interesting in that it shows that myth, taken as a whole, cannot be sober, dispassionate history, since it is always made *ad hoc* to fulfil a certain sociological function, to glorify a certain group or to justify an anomalous status. These considerations show us also that, to the native mind, immediate history, semi-historic legend, and unmixed myth flow into one another, form a continuous sequence, and fulfil really the same sociological function." Here is a valuable new point of view from which to study the intensely mythopœic Maori. The problem of interpreting his traditions is not yet solved.

Granting, as it seems we must, that New Zealand has been populated for much longer than seven centuries, we are faced with the question of the blending of the streams of incoming culture. There arise the questions of the culture of the earlier inhabitants of New Zealand, of the existence of non-Polynesian elements in that culture, and of the borrowing and modification of it by the later-coming Maori. The study of the evidence here produces a growing conviction that the Maori migrants found in New Zealand a developed type of culture in some respects, at any rate, superior to their own. There are certain Maori traditions relating to an earlier population, though as is usual in the case of a dominant people, they tend to belittle the influence of those whom they conquered. Such culture sequences as have been established in the Pacific show that the earlier phase was the more peaceful and all the evidence goes to show that the earlier inhabitants of New Zealand were more or less peaceful. The Maori despised their lack of generalized cruelty and pugnacity. In Maori tradition these earlier inhabitants of New Zealand are known as Maruiwi, so named after one of their chiefs. According to the accounts of their descendants their original homeland was a country much warmer than New Zealand. The question of their relation to the Moriori of the Chatham Islands who reached that country from New Zealand is a difficult and disputed one which has not yet been settled. Skinner, for example, believes the Maruiwi tradition to be mythical. Others have held that the Moriori were the degenerate relics of those *tangata whenua* who did not become incorporated in the Polynesian tribes. These fled to the Chatham Islands and were modified by subsequent migrations of Eastern Polynesians to the Chathams. But, however reliable the traditions regarding an earlier population, evidence is accumulating regarding the existence of a people possessing

a considerable degree of culture. Elsdon Best¹ in bringing together some of the evidence regarding the original inhabitants of New Zealand and their culture showed that there existed in these islands customs, arts and artifacts not traceable to Polynesia. He noted among other things cannibalism, which, though practised in some islands, was not universal throughout Polynesia and seems to have been adopted by the Maori from the Maruiwi. So also were certain forms of human sacrifice, for example that consisting of the burial of human beings at the bases of stockade posts and house posts. These are interesting facts in view of Perry's theory of the origin and development of war and the increase in organised violence which characterised the later phases of the archaic civilisation. We appear to have here, in these early customs, evidences of contact with this ancient and highly developed form of human culture. Perry in his "Growth of Civilization" has argued that human sacrifice and cannibalism were customs associated originally with the ruling classes of the archaic civilisation. The Maori brought a more generalised type of violence which appears to represent a later phase of culture-sequence in the Pacific. This phase, as Perry has shown, led to cultural decadence. "In the Pacific," he says, "the rise of warfare coincides with the degeneration of culture in the arts and crafts." It may, therefore, be suggested that the highly developed fighting habits of the Maori led to a degeneration of culture in these islands. According to Campbell and Rutland the practice of cremation was also adopted by the Maori from the earlier inhabitants, though later modified as war and the desecrating of the graves of the dead became more common. Elsdon Best has further stated that certain weapons seem to have been adopted by the Maori from the people whom they found in occupation. Especially interesting is the case of the bow. There were certain Maori traditions relating to its use by the earlier inhabitants and some years ago a bow was found two feet below the surface in swamp-land north of Auckland. Apparently the Maori did not adopt the bow as a weapon and it degenerated into a child's toy and as such was well known among them. Other stone and wooden artifacts not traceable to Polynesia have also been found. There is, further, the important question of the origin of the highly developed carving of the Maori. Gudgeon, in discussing some thirty years ago the question of the pre-Maori inhabitants of New Zealand, wrote: "There is yet another and more important reason for presuming the existence of an ancient and non-

¹ It is worth noting that Elsdon Best is at present translating a Toi tradition to the effect that the immigrants did not understand the language of those they found here until two years had elapsed.

Polynesian people, and that is the peculiar and highly conventional carvings of the Maori; and their pattern of tattoo. It seems beyond a doubt that the Maori did not bring his knowledge with him from the Pacific islands, and it is not likely that such a remarkable form of art has developed itself among the Maori in the few hundred years between the advent of the Arawa migration and the visit of Captain Cook. Many splendid specimens of ancient carvings have been dug up out of swamps, where they have lain presumably for hundreds of years, but in these we see no sign of the beginner's hand; they are of the same type as those of the present day, but better finished, and of a pattern to be found only in New Zealand; but when or where originated we know not." Some of the ancient carvings which have been discovered are certainly not of the usual Maori type nor have they parallels in the rest of Polynesia. In 1921 a particularly beautiful carving of unusual design, which has been the subject of much discussion, was found at Kaitaia, North Auckland. Related forms in ivory and bone have been found in New Zealand, but for parallels we have to go as far as New Guinea and Borneo. Many interesting remains of early occupation have been discovered in the Pelorus District of New Zealand. They have been found in a district which at the time of the visit of Captain Cook was covered with forest. "The uncovering of the land," says Rutland, "has brought to light traces of human occupation wholly unexpected. Scattered over the steep hillsides and on the small flats, pits, terraces, shell heaps, cooking places, sepulchral mounds, stone implements and other relics have been discovered in numbers that testify plainly to a large population." The pits are lined with stone and some of them are cut out of the rock. Many types of stone implements were found associated with them. "Every part of the ground furnishes the same unmistakable evidence that the forest has taken possession of land once occupied by man." What exactly the pits were, whether dwellings, as some have suggested, or sweat-baths, has not yet been determined. Undoubtedly the Pelorus district is a most important archæological field. Westman has reported traces of ancient human occupation on the Great Barrier Island, near Auckland, where there are terraced hillsides with stone facings and enclosures fenced in by stone walls. Out of the enclosures large trees are now growing. Rock paintings and rock carvings have also been discovered in New Zealand, and von Haast, writing last century said of them: "I have no doubt that these rock-paintings, when closely examined by archæologists and linguists will throw some light upon the questions at issue, and at least prove that at one time there has been some immigration to New Zealand, from the north-

west and from countries which then possessed a far higher civilization than the Maori ever reached." (The same authority held, as many others have done, that the moa had been exterminated by the inhabitants of New Zealand in pre-Maori days.) Some two years ago a series of rock carvings of conventionalised canoes was found in a cave-shelter on the Kaingaroa Plains near Rotorua. In the discussion which has followed regarding these carvings there has been noticeable a tendency to dismiss them as recent work of little or no significance: "the idle play of idle people, forgotten as soon as done." One would have thought that the number of times that anthropological discoveries which later proved to be of the greatest significance, have first been regarded in this way, would make New Zealand ethnologists hesitate before lightly dismissing material of this kind. Elliot Smith, at any rate, takes these rock carvings as new and additional evidence of the widespread wanderings in Oceania of ships conforming to types originally invented in ancient Egypt. It seems significant that the Maori tribe which has held the Kaingaroa lands for ten or twelve generations not only knows nothing about the carvings, but did not even know of the existence of the shelter.

The student of Polynesian ethnology in examining the wealth of material which has been collected, is faced again and again with the notion of the decay and loss of cultural forms. Rivers, for example, in his "Social Organization" discussing Polynesian systems of kinship and relationship writes: "We now know that the Polynesians are a highly developed people intellectually, and have social institutions, and especially political institutions, of an advanced kind. The rudeness of their material culture is a result of their simple environment in Oceanic islands. There is little doubt that their ancestors made pottery, and that this art disappeared, perhaps as the result of the paucity of suitable material; and many of us are coming to believe that these ancestors were also acquainted with metal-working." On this latter point Percy Smith has called attention to faint memories of metals in their traditions. Of the loss of knowledge among the Maori Colenso wrote: "It is evident that they possessed the germs of knowledge of the first principles of mechanics, but it appeared more like a decaying remnant of ancient wisdom . . . than a new and recent development." This brings us again to the question of the archaic civilisation and its possible influence in Polynesia and in New Zealand.¹

¹ It is interesting now to recall that Rutland writing in 1896 on "Traces of Civilization: An Inquiry into the History of the Pacific," suggested the spread of ancient civilisation across the Pacific to America. "There was," he said, "the possibility of the ancient American civilization having been derived from Asia by way of Polynesia, or, in other words, the possibility of civilization, taken as a whole, being monogenetic, instead of polygenetic as hitherto supposed."

The motives which are believed to have led to the diffusion of the archaic civilisation—the desire for gold, pearls and other substances regarded as magical “life-givers”—have already been mentioned. So far as gold is concerned there is one slender thread of evidence that the goldfields of New Zealand may have been discovered and worked in ancient times. In 1869 von Haast reported an interesting discovery at Bruce Bay. In a gold claim in the forest belt near the shore, “on argillaceous gravel, a party of miners . . . found a stone chisel and a sharpening-stone lying close to each other; the former was broken, having been accidentally struck by the pick when the miners were loosening the wash-dirt. The stone chisel is made of a dark greenish chert, and is partly polished; the sharpening-stone is made of a coarse greyish sandstone.” The beds through which the miners had been working, were quite undisturbed, and some very large trees had been growing just above that portion of their claim, near the centre of which these stone implements had been found. Pearls are unimportant so far as New Zealand is concerned, though not in the rest of Polynesia, and Perry has suggested that the widespread myth of the fishing up of islands by *Mau*i really has reference to pearl-fishing. Regarding jade the case is very different. Jade was one of the “givers of life” and the search for it one of the motives which carried the archaic civilisation far and wide. It seems very likely that the desire for it, and its existence in New Zealand, was one of the reasons that led to the presence of early inhabitants in New Zealand. The Maori made weapons, tools and ornaments of the nephrite found here, and there is evidence that it was carried from New Zealand to central Polynesia and so led to subsequent migrations from that region. The use of this substance seems to have been learned by the Maori from the earlier inhabitants. This was the view advanced by Rutland who, on the basis of the traditions of the Pelorus Maori tribes regarding earlier inhabitants, wrote: “The ancient inhabitants were unwarlike, but skilful in various arts, notably the working of greenstone, which their conquerors acquired from them.” In another paper, “Did the Maori Discover the Greenstone?” Rutland goes more fully into the evidence on this point. Discussing the beliefs connected with jade in different parts of the world he says: “How did the ancient inhabitants of New Zealand discover the jade or greenstone in the wild forest country of the South Island? Why from amongst the countless varieties of rock the land affords, did they select it, make it a mark of rank, surround it with superstition, and take to burying it with their dead? There is but one possible explanation. A knowledge of the greenstone, the superstitions connected with it, the mode of working, and

an idea of its value that made them seek it as we now seek gold, were imported from their former home." Looking for this home, Rutland turns to the nearest place where jade is found—New Caledonia, where "have been discovered traces of a higher civilization than existed at the time in any part of Polynesia." The relevance of this statement will appear presently.

The cult of the Sun and the Sky World were important elements in the culture of the archaic civilisation and traces of both these features are to be found in New Zealand. In New Zealand mythology the human race originated from *Tane*, a being from the Sky World, and according to Elsdon Best, *Tane* was probably the sun. Tregear and Percy Smith have both recorded evidence of the existence in New Zealand of sun-worship and an annual sun-festival. There are also relics of the belief in the Sky World. Elsdon Best says of this: "The broad path of *Tane* is the path or way by which the spirits of the dead pass on their way back to the fatherland of the race, the place where man originated, whence they pass down to the underworld or ascend to the heavens according to whether they sympathise most with the Earth Mother or the Sky Father parent." Mummification was also an important feature of the archaic civilisation and it is now claimed that, originating in Egypt, the modified forms of this practice found in other parts of the world are evidences of contact with this civilisation. Elliot Smith says regarding this that "it is certain that the main stream of the wanderers who carried the knowledge of mummification to the East must have set out from the East African Coast, because a whole series of modifications of the Egyptian method which were introduced in the Soudan and further south, are also found in Indonesia, Polynesia and America." The many similarities between Egyptian and certain Melanesian practices designed to preserve the dead were part of the evidence which convinced Rivers that Egyptian influence had reached the Pacific. The former existence of mummification in New Zealand has been denied, but the evidence of Tregear seems definitely to establish it, probably as a degenerate relic of a practice more highly developed elsewhere. In this connection it may be suggested that the various Maori modes of disposing of the bodies of the dead would repay further study from the comparative point of view. Rivers points out that there are few customs regarding which man is more conservative than in his modes of treatment of the bodies of the dead, and these customs provide valuable evidence for tracing the diffusion and blending of cultures.

Other subjects which suggest themselves for further intensive study are the practice of tatooing and the use of

symbols. Much new light has been thrown on both these subjects by recent investigations which aim at applying and testing some of the newer ethnological concepts and theories. Hambly, in his "The History of Tattooing and its Significance," writing from the point of view of diffusion, shows that the explanation of tattooing as due to the desire for ornament is superficial and that the evidence for a deeper magico-religious origin and significance of the practice is incontrovertible; as also is the case for its diffusion.

Degeneration may of course lead to a certain loss of the original meaning of the custom, and it appears to have done so in the case of Maori tattooing. In view of the importance of tattooing in Maori life Hambly's comprehensive study of the significance and migrations of the practice is of great value. Mackenzie's recent book, "The Migration of Symbols and their Relations to Beliefs and Customs" is also of interest and of value. The great ancient arts, he points out, were rooted in magico-religious beliefs, and it can no longer be held that art motifs which were preserved for many centuries and diffused over wide areas, are to be interpreted exclusively from the æsthetic point of view. "It will be found that the so-called 'simple symbols,' like the swastika and the spiral, do not even among 'backward' peoples express merely 'simple ideas' connected with ordinary everyday experiences, but rather highly complex beliefs, which have a history and appear to have been acquired from the ancient centres of civilization. The view that the Polynesian, who tattooed a spiral on his face, was moved to do so in response to the appeal of his æsthetic sense is one which is exceedingly difficult to accept. There must have surely been a fundamental psychological motive for this deliberate act of facial disfigurement." Of the symbols with which Mackenzie deals the spiral is of the greatest interest to students of Polynesia, and the movements of this symbol and the beliefs connected with it are fully traced. Many of the suggestions which have so far been put forward to account, on local grounds, for the free use of this symbol in Maori art seem far too simple.

IV.

In his address on "The Peopling of Polynesia," delivered in New Zealand in 1914, Rivers aimed at showing, as a result of the analysis of modes of treatment of the dead and also of decorative art, that the population of most parts of Polynesia has two strata, to which a third has been added in New Zealand. He noted the features which distinguish New Zealand culture from that of the rest of Polynesia, particularly curvilinear art and forms of tree burial. "The evidence," he says, "points to the presence in New Zealand of a people who used

the spiral and other curvilinear forms in their art and practised a cult in which trees stood in some kind of intimate relation to the dead." Both these elements appear throughout the greater part of Melanesia, but particularly in New Guinea. They are highly developed among the Massim of south-eastern New Guinea. How did they reach New Zealand? "Beyond all doubt," says Rivers, "the north-eastern corner of New Guinea has been a place of much importance in the peopling of the Pacific. Many of the settlers in the islands of Oceania must have coasted the northern shores of New Guinea and have reached, at its south-eastern corner, a parting of the ways; there being several alternative routes, one eastward along the northern coast of New Guinea towards Australia; and another northwards towards New Britain and New Ireland; and still another southwards towards the Solomons. I venture to suggest that still another path has been directly southwards by sea to New Caledonia and avoiding the greater part of Melanesia, so that New Caledonia would be the point of departure for the still more perilous journey to New Zealand." This is a suggestion of the greatest significance and one which deserves the closest study. It appears to co-ordinate at once many facts regarding the origin and relationships of Maori culture. Certain affinities have been pointed out between the culture of the Maori and that of the Marquesas Islands. Linton has recently discussed these resemblances and says: "The Maori and Marquesan cultures show so many similarities that, in the absence of historic contact, they must be considered as not very divergent developments of a single ancestral culture." In a later publication he suggests that the puzzling three-finger convention of Maori art is an extension of the Marquesan convention of joining the grooves outlining the two outer fingers, thus dividing the hand into three parts. Within Polynesia itself Maori decorative art is no doubt most closely related to that of the Marquesans, though the art of the latter shows influences which New Zealand has escaped. But there are many more points of resemblance in the New Guinea area. It is highly significant that the working of jade is common to New Guinea, New Caledonia and New Zealand. Most important, too, are the markings on heads with pottery faces found in the Sepik River area, north-east New Guinea. To quote Rivers: "Here, far up the river and evidently the relics of some very old migration, there are preserved heads with marks so closely resembling the tattooing of the Maori that, when combined with other features of culture common to the two peoples, there can be little doubt that the explanation is to be found, not in independent origin, but in the prolongation of a migration from some place still unknown." Skinner has recently

brought together and illustrated much of the evidence connecting the cultures of New Zealand, of the New Guinea area and that of areas still further to the north-east. In the Massim area of New Guinea there are carved canoe sterns showing points of similarity to Maori canoe carvings. Hornell has traced these canoe carvings further into Dutch New Guinea and into the Malay Archipelago. The similarities between Maori and Massim canoe bailers are even closer. Parallels have also been shown to exist between the human figures carved in high relief on Maori doorways and those on doorways in the Philippines. The Kaitaia carving, already mentioned, finds parallels in north-east New Guinea and in Borneo; and Maori rafter patterns appear to be allied to patterns on house planks in Dutch New Guinea. Skinner's study of culture areas in New Zealand makes it clear that it is in what he terms the Northern culture that Melanesian influence is most prominent, and, as he says, it is tempting indeed to suggest an early ethnic wave from the west Pacific into northern New Zealand. We have now at any rate a direction in which to look for the source of many features of Maori culture, and we may expect that future investigation will lead us back further and further. And, apart from material culture, one is reminded that the frequent appearance of Melanesian bodily characteristics was noted and remarked on by a number of early visitors to New Zealand and that subsequent study has supported these observations. Regarding customs, Perry has shown that the practices of cannibalism and human sacrifice to which reference has already been made, existed in New Guinea among the Massim and others, where they are closely connected with the influence of the archaic civilisation. They also flourished in New Caledonia, "a place ruled over by the Children of the Sun." Thus all the evidence regarding the culture of the earlier inhabitants of New Zealand is leading us back towards those regions where the influence of the archaic civilisation is very directly apparent.

In his "Thoughts on Comparative Mythology," published some thirty years ago, Tregear, writing of the Polynesian peoples in general, made a statement which may well be quoted in conclusion. "They may be," he said, "and probably are, the degraded descendants and broken remnants of mighty peoples, and their simplicity is not the result of innocence, but of ignorance and decay." This remark appears to be fully applicable to the Maori of New Zealand, and the material which has been brought together in this brief preliminary survey of the subject and the suggestions which have been made for further study seem to promise that it can be given a wealth of content.

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NOTES BY THE WAY.

III.

"Erudition without philosophy is neither criticism nor history, but mere formless matter." (*Benedetto Croce: An Autobiography*.)

IV.

"I cannot remember that I ever for a single moment lost my hold on the distinction between sensuous refinement and spiritual fineness, erotic flights and moral elevation, sham heroism and stern duty; and though here and there D'Annunzio's art won my admiration, I never felt even a fleeting and sentimental agreement with the ethics which he suggested or preached outright. The kinship or resemblance between D'Annunzio's work and my own, of which young critics have more than once written, is a mere product of their fancy and gives ground for suspecting that these critics fail to make the distinction mentioned above, which to me has always been perfectly sharp." (*Benedetto Croce: An Autobiography*.)

V.

"And now I met with another proof of the truth, that books which remain dumb and unintelligible to a reader who has never worked for himself at a subject connected with their own, become charged with power when they begin to converse with us and help us to clarify half-formed thoughts of our own, to change into conceptions our own presentiments of conceptions, to support and encourage us in the way that we have already taken or at which we have all but arrived." (*Benedetto Croce: An Autobiography*.)

DESCARTES' THEORY OF KNOWLEDGE.

AS SET FORTH IN THE FIRST TWELVE OF HIS
"RULES FOR THE DIRECTION OF THE
MIND."

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THE aim of study, according to Descartes, is not to crowd the memory with a mass of facts, but so "to increase the natural light of reason"¹ that the mind may enunciate "sound and correct judgments on all matters that come before it."² True knowledge does not consist of a collection of propositions which, as a matter of fact, are true, but in the clear insight into their truth by an attentive mind. "We shall not, *e.g.*, all turn out to be mathematicians though we know by heart all the proofs that others have elaborated, unless we have an intellectual talent that fits us to resolve difficulties of any kind. Neither, though we have mastered all the arguments of Plato and Aristotle, if we have not the capacity for passing a solid judgment on these matters, shall we become philosophers; we should have acquired the knowledge not of a science but of history."³ Mere factual knowledge is not sufficient; true or scientific knowledge consists not in the knowledge that such are the facts, but in the perception of how we know they are so, and why they are so. Mathematical treatises of Descartes' contemporaries, though they set out many propositions which on calculation he found to be true, failed to attain to Descartes' ideal of knowledge in that they "did not seem to make it sufficiently plain to the mind itself *why* those things are so, and *how* they discovered them."⁴

This insight of an attentive mind, which alone constitutes true knowledge, Descartes calls *intuition*. By intuition he understands "not the fluctuating testimony of the senses, nor the misleading judgments that proceed from the blundering constructions of imagination, but the conception which an unclouded and attentive mind gives us so readily and distinctly that we are wholly freed from doubt about that which we understand. Or, what comes to the same thing, intuition is the undoubting conception of an unclouded and attentive mind and springs from the light of reason alone."⁵

¹ Haldane and Ross, Vol. 1, p. 2.

² *Ibid.*, p. 1.

³ *Ibid.*, p. 6.

⁴ *Ibid.*, p. 11 (*italics mine*).

⁵ *Ibid.*, p. 7.

In the first place, then, though in suitable circumstances it may be assisted, stimulated, or even originated by other faculties, intuition or the insight in which true knowledge consists, springs from, or is an act of, the understanding alone. "In the strict sense truth and falsity can be a matter of the understanding alone, though often it derives its origin from the other two faculties."¹ "While it is the understanding alone which is capable of knowing, it yet is either helped or hindered by three other faculties, namely, imagination, sense and memory."² "Understanding is indeed alone capable of perceiving the truth, but yet it ought to be aided by imagination, sense and memory."³

Though Descartes thus distinguishes understanding from sense and imagination, and refuses to admit that these latter can supply any true knowledge, his distinction is not the Kantian. The term "understanding" to whose activity alone he attributes knowledge, is not used in Kant's restricted sense. In the first place, he does not distinguish between understanding and reason. There is no higher faculty; the understanding itself constitutes the "natural light of reason." Secondly, the understanding is not a faculty of concepts as opposed to a faculty of intuition and of judgment, but is a complete faculty of knowledge. Sense and imagination do not constitute faculties coordinate with the understanding, each supplying elements necessary for all knowledge, but are at best mere "aids of the understanding" which do not as such even belong to the mind, but are genuine parts of the body.⁴ That, however, does not mean that the understanding is merely discursive intellect, or that the knowledge it yields is purely "rational" in the sense of being constructed by the mind regardless of the "given" or independently real. Rather Kant's intuition, imagination, understanding and reason are all included within Descartes' "understanding."

The understanding, for Descartes, is a faculty of insight, insight into the nature of reality, issuing in self-evident judgments. Though contact with reality may ultimately involve another faculty, the other faculty does not so much supply an element necessary to the cognition, as constitute the material instrument by means of which we come into contact with the real, in the same way as the microscope brings us into contact with the "microscopic" world. In any case, the insight, the mind's grasp of reality, comes from the understanding, which alone constitutes the cognitive mind. "That power by which we are properly said to know things is purely spiritual, and

¹ *Ibid.*, p. 25.

² *Ibid.*, p. 27.

³ *Ibid.*, p. 35.

⁴ *Ibid.*, p. 38.

not less distinct from every part of the body than blood from bone or hand from eye. . . . It is one and the same agency which, when applying itself along with the imagination to the common sense is said to see, touch, etc.; if applying itself to the imagination alone, it is said to remember; if it turn to the imagination in order to create fresh impressions, it is said to imagine or conceive; finally, if it act alone it is said to understand. . . . Now it is the same faculty that in correspondence with those various functions is called either pure understanding, or imagination or memory or sense."¹ Descartes' conception of the nature of the understanding and its relation to sense, imagination *et cetera* is thus very similar to Ward's conception of attention and its relation to the various classes of presentations.

Secondly, intuition is self-evident.² Fundamentally this self-evidence means neither the inconceivability of the opposite, nor the evidence of implication. Primarily and essentially the intuition is self-evident neither because its opposite is inconceivable, nor because it is necessarily implied by some concept or proposition. Strictly speaking, were this the nature of its evidence, it would not be *self-evident* at all; its evidence would depend on something else and would ultimately and in principle involve an infinite regress. Intuition is truly self-evident, self-evident in the more fundamental sense that the mind attending to it immediately clearly and distinctly perceives its truth; its truth is obvious to, and cannot be doubted by, any mind that attends to it. The inconceivability of the opposite and the evidence of implication are only special cases of this more fundamental self-evidence which is grounded in or consists in the transparent insight of the mind as mind into the nature of reality.

Not only Descartes' definition of intuition, but his whole treatment of the subject, seem to bear out this interpretation. There seems no other way of accounting for his choice of examples. "Thus each individual," he says, "can mentally have intuition of the fact that he exists, and that he thinks; that the triangle is bounded by three lines only, the sphere by a single superficies, and so on."³ Each of these examples should reveal the self-evidence of intuition. Now, whereas in each case the intuition is self-evident in the sense that its truth can be perceived immediately and directly simply by attending to the reality in question, in one case at least, namely the intuition that I think, it is impossible to reduce this self-evidence to the inconceivability of the opposite or

¹ *Ibid.*, p. 38-9.

² *Ibid.*, p. 45.

³ *Ibid.*, p. 7.

the evidence of implication. To know that I think I must perceive it immediately. This direct perception, then, it would seem, is the one factor common to all his examples.

Descartes' habit of always describing intuition in terms of vision likewise seems appropriate only if the self-evidence of intuition is interpreted in this way. He speaks for instance of "mental vision,"¹ of "the mind that has a clear vision of each step,"² or again of "what we can clearly and perspicuously behold."³ Again, our power of intuition depends on our perspicacity, and this can be cultivated "by viewing single objects distinctly."⁴

Finally, we shall find that the same interpretation is implied by his conception of Simple Natures, particularly by his doctrine that these are known *per se*.⁵

Such being the nature of intuition, in which alone true knowledge consists, it follows that "nothing can be added to the pure light of reason which does not in some way obscure it."⁶ This is true despite the fact that he immediately adds a "supplementary method of knowing, *viz.*, knowing by deduction,"⁷ and subsequently introduces two other processes, namely, enumeration and induction. All these, as cognitions, depend upon and ultimately and in principle are resolvable into intuitions.

By *deduction* Descartes understands "the pure illation of one thing from another,"⁸ or "all necessary inference from other facts that are known with certainty."⁹ The introduction of this supplementary process could not be avoided because "many things are known with certainty, though not by themselves evident, but only deduced from true and known principles by the continuous and uninterrupted action of a mind that has a clear vision of each step in the progress."¹⁰

Deduction thus depends on intuition in a twofold way. Firstly, the facts known with certainty from which the inferences are deduced can be known only by intuition. Without intuition deduction has no starting point. Secondly, the very act of deduction, the inferring of one fact from another, depends on the insight that the one involves or implies the other, *i.e.*, depends on intuition. "If in the matters to be examined we come to a step in the series of which our understanding is not sufficiently well able to have an intuitive

¹ *Ibid.*, p. 45.

² *Ibid.*, p. 8.

³ *Ibid.*, p. 5.

⁴ *Ibid.*, p. 28.

⁵ *Ibid.*, p. 42.

⁶ *Ibid.*, p. 10.

⁷ *Ibid.*, p. 8.

⁸ *Ibid.*, p. 4.

⁹ *Ibid.*, p. 8.

¹⁰ *Ibid.*, p. 8.

cognition, we must stop short there."¹ "This evidence and certitude . . . which belongs to intuition is required not only in the enunciation of propositions, but also in discursive reasoning of whatever sort."² "All knowledge is of the same nature throughout."³ Thus, on Descartes' own admission, deduction is ultimately and in principle simply the self-development of intuition. Nevertheless, despite their fundamental identity, a legitimate if relative distinction can be drawn between them. "Two things are requisite for mental intuition. Firstly, the proposition intuited must be clear and distinct; secondly, it must be grasped in its totality at the same time and not successively."⁴ Though deduction likewise must be clear and distinct, it is distinguished from intuition by the fact that into it (1) "there enters a certain movement or succession" which is absent from intuition, and (2) "deduction does not require an immediately presented evidence such as intuition possesses; its certitude is rather conferred upon it in some way by memory."⁵ The distinction is perhaps rather between intuition in general and a special application of intuition, than between intuition and an auxiliary process of knowing.

It is this fundamental identity of deduction with self-evident intuition which accounts for the infallibility of deduction. No rational mind could fail to see either the absolute certainty of the initial principle or its indubitable implication by the deduced consequence. Hence deduction "cannot be erroneous when performed by an understanding that is in the least degree rational. . . . None of the mistakes which men can make (men, I say, not beasts) are due to faulty inference."⁶

Descartes' conception of the relation of enumeration and induction to one another and to deduction is not altogether clear. His definition of enumeration as "an inference drawn from many and diverse things" he seems to regard as a summary of the discussion in rule 7.⁷ There he asserts that "if we wish our science to be complete, those matters which promote the end we have in view must one and all be scrutinized by a movement of thought which is continuous and nowhere interrupted; they must also be included in an enumeration which is both adequate and methodical. . . . Here we maintain that an enumeration (of the steps in a proof) is required as well (as the mere deduction of the ultimate

¹ *Ibid.*, p. 22.

² *Ibid.*, p. 7.

³ *Ibid.*, p. 47.

⁴ *Ibid.*, p. 33.

⁵ *Ibid.*, p. 8.

⁶ *Ibid.*, pp. 4-5.

⁷ *Ibid.*, pp. 19-22.

conclusion),¹ if we wish to make our science complete. For resolving most problems other precepts are profitable, but enumeration alone will secure our always passing a true and certain judgment on whatever engages our attention; by means of it nothing at all will escape us, but we shall evidently have some knowledge of every step.

"This enumeration or induction is thus a review or inventory of all those matters that have a bearing on the problem raised, which is so thorough and accurate that by its means we can clearly and with confidence conclude that we have omitted nothing by mistake. . . .

"Furthermore we must note that by adequate enumeration or induction is meant only that method by which we may attain surer conclusions than by any other type of proof, with the exception of simple intuition. But when the knowledge of some matter cannot be reduced to this (*i.e.*, to simple intuition)² we must cast aside all syllogistic fetters and employ induction, the only method left us, but one in which all confidence should be reposed. For whenever single facts have been immediately deduced the one from the other, they have already been reduced, if the inference was evident, to a true intuition. But if we infer any single thing from various and disconnected facts, often our intellectual capacity is not so great as to be able to embrace them all in a single intuition; in which case our mind should be content with the certitude attaching to this operation. It is in precisely similar fashion that we cannot with one single gaze distinguish all the links of a lengthy chain, yet if we have seen the connection of each with its neighbour, we shall be entitled to say that we have seen how the first is connected with the last."³

Enumeration and induction, it would seem from this passage, are used as alternative terms for the same process, a process which is essentially an elaboration of the process of deduction. This elaboration is introduced to ensure both the accuracy of our knowledge and its extension to all matters that lie within the reach of human knowledge. Deduction demands that the implication of the conclusion by the self-evident proposition from which it is inferred should also be self-evident or intuitive. This demand is easily satisfied when single facts are immediate deductions from primary and self-evident principles, for then "they have already been reduced, if the inference was evident, to a true intuition." But how is this result to be achieved when (*a*) the desired conclusion, though deducible from a single self-evident proposition, cannot

¹ First parenthesis the translator's, the second mine.

² Parenthesis mine.

³ *Ibid.*, p.19-21.

be inferred from it, when, that is, the inference involves "a long series of transitions from ground to consequent"?¹ (b) the desired result can be deduced only from "various and disconnected facts," just what facts being unknown?

In both these cases we must have recourse to Enumeration or Induction. This process covers both (1) the enumeration (in the narrower sense) or setting out of both (a) the grounds of the deduction, and (b) the steps or intermediate conclusions in the deduction, and (2) the act of inferring each conclusion from its ground or grounds. Suppose, for example, we wish to discover the relation between the magnitudes A and E, when all that we can immediately discover is the relation between the magnitudes A and B, B and C, C and D, D and E. In this case would first set out all these relations, each of which is discovered intuitively. Then, taking together the relations of A and B and B and C, we would infer, again intuitively, the relation of A and C, then similarly of A and D, and continue thus until we arrived at the relation of A and E.

It is true that at times Descartes seems to use the term enumeration in the stricter sense of "setting out" or "specifying"—now of setting out the grounds of an inference ("a review or inventory of all those matters that have a bearing on the problem raised"),² now of the steps in the inference ["an enumeration (of the steps in a proof)"], now of analogous cases ("enumerate all the other potencies"),³ now of all possible alternatives ("all the ways . . . in order that he may follow the right way").⁴ Again, common usage would lead us to associate induction only with the actual inference, more particularly with inference from "many and various facts." Nevertheless rule 7 taken as a whole leaves us no alternative but to conclude that Descartes did not distinguish enumeration and induction, but used them as alternatives, and identified both with this whole process of inference.

Enumeration is necessary "to gain admission among the certain truths for those which are not immediate deductions from primary and self-evident principles."⁵ Enumeration ensures both the accuracy of such knowledge as cannot be attained by immediate intuition and also its extension to whatever is not beyond the capacity of the human mind. As each step in the enumeration is intuitively evident, we are thus certain of the accuracy of the whole inference, and

¹ *Ibid.*, p. 19.

² *Ibid.*, p. 20.

³ *Ibid.*, p. 24.

⁴ *Ibid.*, p. 25.

⁵ *Ibid.*, p. 19.

consequently of the truth of the final result. Further, in this enumeration any ground of, or step in, the inference which may be of value either for its own sake or for other of its implications is clearly shown. Finally, as all the factors which can assist us in solving the problem in question are clearly set out, we can see at once whether the problem is soluble in the present state of our experimental knowledge.¹

As regards the relation of intuition, deduction and enumeration, if we consider deduction as a process in the course of achievement, deduction, as we saw, is distinguished from intuition in that "it appears not to occur all at the same time, but involves a sort of movement on the part of our mind when it infers one thing from another." If we restrict the term deduction to this movement of inference, deduction occurs both beyond enumeration, namely when we deduce a result immediately from a single self-evident principle, and also within enumeration. But it does not cover the whole of enumeration; it covers only the act or acts of inference, it does not include the setting out of the grounds of the inference. If, on the other hand, we regard deduction as including all that is involved in arriving at the conclusion, then enumeration is simply a special case of deduction, what might be called complex deduction.

On the other hand, if we consider deduction not as "a movement, but rather the completion of a movement," provided it is simple and clear, it falls within intuition. If, however, it is complex and involved, and so cannot be grasped as a whole at the same time by the mind, it becomes enumeration or induction.

Though the process of enumeration as a whole extends beyond any one simple intuition, nevertheless each stage in the process must be intuited, and the certainty of the conclusion rests on this insight. "These two operations (enumeration and intuition) aid and complete each other. In doing so they seem to grow into a single process by virtue of a sort of motion of thought which has an attentive and vision-like knowledge of one fact and yet can pass at the very same moment to another."² If we emphasise the self-evident insight of intuition rather than its lack of succession, this single process becomes essentially an intuition. Enumeration, like deduction, is in last resort a self-development of intuition.

All knowledge, then, consists ultimately of intuitions. That is to say, all knowledge, no matter how complex its object, is resolvable into certain simple and self-evident prin-

¹ Cf. Descartes' example of the magnet, p. 47.

² *Ibid.*, p. 34.

ciples and equally self-evident deductions from these. "None of the sciences, however abstruse, is to be deduced from lofty and obscure matters, but . . . all proceed only from what is easily and more readily understood."¹ These self-evident principles set forth the character of what Descartes calls *simple natures*. These simple natures are not concrete things, nor yet atoms or concrete elements of reality. They are *natures*—characters, features or aspects of reality. They are not fictitious creations of the mind, by it referred to, or imposed upon, a foreign reality; they are real; not isolated real things, it is true, but nevertheless genuine features of reality. At the same time, they subsist *as such* only for the mind. Though they are not mere figments of the mind, nevertheless they are nothing, nothing distinct, nothing subsisting, apart from the mind. There are natures only for a knowing mind; they subsist only as intuited. In the same way, they are simple not in concrete reality, but only in relation to the understanding, or as known. "Relatively to our knowledge, single things should be taken in an order different from that in which we should regard them when considered in their more real nature. Thus, for example, if we consider a body as having extension and figure, we shall indeed admit that from the point of view of the thing itself it is one and simple. For we cannot from that point of view regard it as compounded of corporeal nature, extension and figures, since these elements have never existed in isolation from each other. But relatively to our understanding we call it a compound constructed out of these three natures, because we have thought of them separately before we were able to judge that all three were found in one and the same subject. Hence, we shall treat of things only in relation to our understanding's awareness of them, and shall call those only simple the cognition of which is so clear and so distinct that they cannot be analysed by the mind into others more distinctly known."² The simple nature, then, is the object of an ultimate elemental act of knowledge, and can be defined or specified only from this point of view.

Simple natures are characters common to, and perceived by the mind in, different things; they are features of reality which, from the point of view of the mind, connect or relate different things; they are characteristics of reality which are simple in so far as they are universal. "For the purpose of our procedure which does not regard things as isolated realities, but compares them with one another in order to discover the dependence in knowledge of one upon the other,

¹ *Ibid.*, p. 29.

² *Ibid.*, pp. 40-1.

all things can be said to be either absolute or relative. I call that absolute which contains within itself the pure and simple essence of which we are in quest."¹ Simple natures, then, like Plato's ideas, are real though universal characters which constitute the rational organisation of reality, or at any rate such of these characters as can be cognised in an elemental act of knowledge.

It is clear that simple natures can be intuited, that intuition yields or is knowledge, and that ultimately no knowledge is possible except in the form of a proposition. Hence, there can be no doubt that the elemental act of knowledge which specifies a simple nature must take the form of a simple proposition. A mere concept, if thereby we understand less than a complete act of knowledge is not sufficient, for the simple nature is the object of a complete act of knowledge. This is true despite Descartes' citation of such examples of simple natures as Extension, Figure and Motion, and despite his assertion that simple natures cannot be defined.² Definition implies the differentiation of a more simple or ultimate concept. In the case of a simple nature, no more ultimate concept of which it can be regarded as a differentiation can be found. Nevertheless, that does not imply that the simple nature must be grasped in an absolutely undifferentiated cognition such as the thought of Parmenides "It is" would have to be. No such cognition is possible. Knowing is an activity, it essentially involves a movement of thought, ultimately, Descartes would seem to suggest, it involves a movement between a concrete presented factor and a universal.

Thus, though extension, for example, can neither be resolved into a number of simpler components which can be thought independently of one another, nor regarded as a special case of a more general character, nevertheless we neither think of it as a completely undifferentiated unit, nor is our thought of it a single undifferentiated immobile concept. If we try to think of it by itself, we must think of it as containing distinctions of above and below, or here and there, or to the right and to the left *et cetera*, in which case our thought moves from one side of the distinction to the other. Further, these distinctions would be unintelligible apart from the thought of solid things exhibiting secondary qualities. Hence, we can ultimately think of extension only as an aspect of the concrete world of sense, and so our thought of it involves the act of abstraction by means of which we distinguish this

¹ *Ibid.*, p. 15.

² *Ibid.*, p. 46.

aspect.¹ It is in this movement from or to the concrete world of sense, which the thought of it ultimately involves, that we have the final guarantee of the reality of the simple nature.

Here, too, we have the reason, though perhaps Descartes scarcely recognised it, why intuition and enumeration or deduction seem to grow into a single process. The insight by which we grasp one simple nature involves the same movement as the insight by which we pass from one to another. The movement within any proposition and the movement by which the mind passes from proposition to proposition are fundamentally the same. Insight itself is or involves a movement of thought, and does so whether thought rests in a single proposition or makes explicit the implications of one proposition in another.

It follows in the nature of things that "All these simple natures are known *per se*, and are wholly free from falsity. . . . For, if our mind attains to the least acquaintance with it, as must be the case, since we are assumed to pass some judgment on it, this fact alone, makes us infer that we know it completely. For otherwise it could not be said to be simple, but must be complex—a compound of that which is present in our perception of it, and that of which we think we are ignorant."² "In order to know these simple natures no pains need be taken, because they are of themselves sufficiently well known. Application comes only in isolating them from each other, and scrutinizing them with steadfast mental gaze."³

These simple natures constitute, as it were, the elements of knowledge, all other knowing arising from the combination of these. "All the rest of what we know is formed by composition out of these simple natures."⁴ "The whole of human knowledge consists in a distinct perception of the way in which those simple natures combine in order to build up other objects."⁵ "No knowledge is at any time possible beyond those simple natures and what may be called their intermixture or combination with each other."⁶

The question then arises: What does Descartes mean by this composition, intermixture or combination?

In the first place, as is obvious from the character of the simple nature, he does not mean the combination of concrete elements into a more complex whole. There are simple natures only for a knowing mind. In the same way, the com-

¹ C. F. Bradley's "Appearance and Reality," Ch. 4, pp. 36-8.

² *Ibid.*, p. 42.

³ *Ibid.*, pp. 45-6.

⁴ *Ibid.*, p. 42.

⁵ *Ibid.*, p. 46.

⁶ *Ibid.*, p. 43.

bination of simple natures occurs only for the knowing mind; it is a combination of "elements" of knowledge. It is not objects in the sense of things of the concrete world that are built up, but our knowledge of these objects. There is no question of building up concrete reality; the mind does not construct, it knows reality.

In the second place, it does not mean that all our knowledge is built up out of mere concepts that have been divorced from all contact with reality. Such an achievement would obviously be impossible. There is no question of bringing the simple natures in terms of which complex objects are to be known, or from which all our knowledge is to be built up, into contact with concrete reality. They have never been divorced from it, but from the beginning represented *its* universal features. The universal, in terms of which alone knowledge can occur, is not a mere construction of the mind, it is a character of the real as perceived by the mind. Both these features, perception by the mind, and contact with concrete reality, are essential to the conception of the simple nature; both are equally essential to any compound of simple natures.

What Descartes does mean is simply that complex reality can be known only in terms of the simpler features of reality itself. Any reality, even the most complex, in so far as it is knowable at all, can be known only in terms of "universal" features of reality itself which in themselves are simple, and whose nature is self-evident or transparent to the mind. For example: "If I pronounce the judgement that some figure is not moving, I shall say that in a sense my idea (cognition) is a complex of figure and rest," figure and rest being simple natures. No knowledge other than this is at any time possible. The simple natures represent the rationality or rational organisation of reality, reality in so far as it is knowable. Hence any reality can be known only in terms of these simple natures. Anything, so far as it is knowable, contains nothing mysterious, nothing that cannot be known in terms of simple natures. "If the question is, What is the nature of the magnet? people . . . at once prognosticate difficulty and toil in the enquiry, and, dismissing from the mind every well-known fact, fasten on whatever is most difficult, vaguely hoping that by ranging over the fruitless field where multifarious causes lie, they will find something fresh. But he who reflects that there can be nothing to know in the magnet that does not consist of certain simple natures evident in themselves, will have no difficulty how to proceed. He will first collect all the observations with which experience can supply him about this stone, and from these he will next try to deduce the character of that intermixture of simple natures

which is necessary to produce all those effects which he has seen to take place in connection with the magnet. This achieved he can boldly assert that he has discovered the real nature of the magnet in so far as human intelligence and the given experimental observations can supply him with this knowledge."¹

Hence Descartes' assertion that all the rest we know is formed by composition out of these simple natures means only that any real thing which we can know can be known only in terms of these universal features of reality. The mind can never grasp anything as absolutely unique or singular, but nothing that can ever be known is merely unique. Any object, if it can be known at all, can be known only in virtue of its being organic to reality, in virtue of the fact that it exhibits features exhibited by other parts of reality too. That does not mean that anything is a mere combination of pure universals, *i.e.*, of universals that are divorced from concrete reality. A universal, so understood, is self-contradictory. The universal subsists only for knowledge, and knowledge ultimately demands contact with particular or concrete reality.

Nor is this composition merely rationalistic. It may be true that Descartes regarded arithmetic and geometry as the sciences *par excellence*; it is certainly true that he refused the name of knowledge to the merely factual. Nevertheless, he did not claim that we can know the concrete world only in so far as we can understand it in terms of simple natures which can be deduced one from the other, or which mutually imply each other. The conception of all knowledge as the disimplication of one fundamental principle is foreign to Descartes' *Regulæ*. "The union of these things (*i.e.*, simple natures) one with another is either necessary or contingent. It is necessary when one is so implied in the concept of another in a confused sort of way that we cannot conceive either distinctly, if our thought assigns to them a separateness from each other. Thus figure is conjoined with extension, motion with time, and so on, because it is impossible to conceive of a figure that has no extension, nor of a motion that has no duration. . . . The union, however, is contingent in those cases where the things are conjoined by no inseparable bond, *e.g.*, when we say a body is animate, a man is clothed, etc."²

Descartes, then, does not wish to restrict the knowledge which arises from the composition of simple natures merely to the perception of the logical implication of one concept or

¹ *Ibid.*, p. 47.

² *Ibid.*, p. 42.

proposition by another. Indeed, a composition which was restricted to such implication would not constitute true knowledge in that it would ultimately lack the necessary contact with concrete reality. Experience—observation and experiment—makes a necessary contribution which is immediately necessary to some knowledge, and ultimately necessary to all knowledge; comparable to astrologers are “those philosophers who, neglecting experience, imagine that truth will spring from their brain like Pallas from the head of Zeus.”¹ Thus, he who realises that “there can be nothing to know in the magnet which does not consist of certain simple natures evident in themselves” “will first *collect all the observations with which experience* can supply him about this stone, and *from these* he will try to deduce the character of that intermixture of simple natures which is necessary to produce all those effects which he has *seen* to take place in connection with the magnet.” Further, the extent of our knowledge of the magnet depends upon the extent of the “given experimental observations.” So Descartes is able to admit as one of the ways in which composite natures are known to us the fact that “experience shows us what they are.”²

What Descartes does deny in regard to experience is that experience of the particular as particular can ever justify a general conclusion. We lay ourselves open to error “as often as we judge that we can deduce anything universal and necessary from a particular or contingent fact.”³ Such a deduction is justified only if we have reason to believe that the particular fact can be regarded as an instance of a universal law in virtue of which the conjunction of one with the other is wholly necessary.

Fundamentally Descartes' composition theory asserts no more than that “method consists entirely in the order and disposition of the objects towards which our mental vision must be directed if we would find out any truth. We shall comply with it exactly if we reduce involved and obscure propositions (*i.e.*, those that set out the nature of complex natures) step by step to those that are simpler, and then starting with the intuitive apprehension of all those that are absolutely simple, attempt to ascend to the knowledge of all others by precisely similar steps.”⁴

The justification within the sphere with which he is really concerned, of Descartes' composition theory, so understood, is—Modern Science.

¹ *Ibid.*, p. 15.

² *Ibid.*, p. 43.

³ *Ibid.*, p. 45.

⁴ *Ibid.*, p. 14 (parenthesis mine).

DO LINGUISTIC GROUP TESTS OF INTELLIGENCE, NON-LINGUISTIC GROUP TESTS OF INTELLIGENCE AND SCHOLASTIC TESTS MEASURE THE SAME THING?¹

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I.

SECTION 1.—THE NATURE OF THE PROBLEM AND AN ACCOUNT OF THE STEPS TAKEN TO SOLVE IT.

Introductory.

THE subject of these articles was suggested to the writer, in the first instance, by his reading of Professor Spearman's book, "The Nature of Intelligence and the Principles of Cognition," and particularly that portion of the book entitled, "Some Special Cases of Education—Interpretation of Pictures" (pp. 125-128). The extension of the scope of the work to embrace scholastic tests is due to the direct suggestion of Dr. C. R. McRae and to the writer's reading of McRae's unpublished paper, "Some Effects of Social and Educational Opportunities upon Mental Tests."

Spearman's book may be regarded as a formal statement of a theory which he has been elaborating for many years, namely that every cognitive operation is due to the play of two factors, a general factor, *g*, or "intelligence" which is "a hypothetical general and purely quantitative factor, underlying all cognitive operations of any kind"² and a specific factor, *s*, which is "peculiar to"³ the particular operation. A very important corollary to this theory is best stated in Spearman's words: "This is that by pooling a sufficiently large number of any diverse cognitive operations whatever, the general factor can be brought as nearly as desired to sole influence. For each specific factor, since in such pooling it occurs only once out of many times, must necessarily become of correspondingly insignificant weight. Conversely, the general factor, since it occurs every time, must in the end become paramount. But, if that be so, then any two such extensive pools will arrive at approximate accordance with each other."⁴

¹ These articles form part of the writer's thesis for the degree of Master of Education, University of Melbourne.

² and ³ Spearman, *op. cit.*, p. 5.

⁴ Spearman, *op. cit.*, p. 6.

It is essential that we realise the significance of the words, "*diverse*, cognitive operations," for in cognitive operations which are not "*diverse*" there may come in "group factors." A group factor is in no way an additional factor other than *g* and *s*, but is an influence due to a specific factor or specific factors in one operation being identical with one or more specific factors in another operation. When a group factor is present, the influence of *g* in producing any proved agreement between the relative amounts of success obtained in separate operations by different individuals is obscured.

Here, we are concerned with determining whether or not there is a factor common to the cognitive operations demanded for the solution of the types of test with which we are dealing and whether or not there are group factors common to any two types only or smaller group factors common to tests of the same type. We shall find it convenient to use Spearman's symbol *g* for a factor common to all the tests, but we are prepared to admit that this *g* might possibly be shown, by a far more comprehensive investigation, to be a big group factor common to these types of tests and yet other than the "*intelligence*" which is used in the contingencies of everyday life.

Other Work on the Problem.¹

On page 27 of the July, 1926, number of *The British Journal of Psychology*, General Section, there appears an article by Dr. C. M. Davey entitled, "A Comparison of Group Verbal and Pictorial Tests of Intelligence." For a linguistic test, Dr. Davey used an early form of Spearman's oral group test, while of her six picture tests, two, classification and analogies, were similar to the tests of the same name used by us and described later in this article. In fact, about twenty of Dr. Davey's actual examples were used in this investigation. Her other tests were entirely different from ours, and three of them were partly linguistic and partly pictorial. In both investigations, verbal instructions were used in giving the picture tests, but were made as simple as possible. Dr. Davey's subjects were 243 London children from different schools and from different classes within the schools. The ages ranged from 8 years to 14 years. Dr. Davey did not find any evidence of group factors due to linguistic or pictorial presentation. She concluded that, of the two types, the linguistic test was the better measure of *g*. Reference will be made to other aspects of her work as the need to make it arises.

Some comparison of linguistic tests, non-linguistic tests and scholastic tests was made by Dr. C. R. McRae in the

¹ A fuller account of work done on this problem so far as linguistic and picture tests are concerned will be found in Dr. Davey's article.

unpublished paper already referred to. Dr. McRae used two standardised linguistic group tests, some of Dr. Davey's picture tests and three of Burt's "individual" scholastic tests—oral arithmetic, spelling and reading. McRae's work in this connection formed but a small part of his full investigation and is regarded by him as incomplete. Too few subjects were tested, they were not typical, normal school children, and the ranges in chronological and mental ages were too great. Furthermore, the examples used in the linguistic tests were much more numerous than those used in the picture test and superior in quality, so that a just comparison of the two types was not possible. The scholastic tests used were tests which, it was frankly admitted, would give results corresponding closely to those obtained by the use of "intelligence" tests. So far as picture tests are concerned, McRae's conclusions are similar to those of Dr. Davey. He found also that, "the order in which subjects are placed by a representative scholastic test agrees very substantially with the order in which they are placed by a representative mental test" and that "the value of non-verbal tests decreases with age."

Tests Used in the Present Investigation.

As it was impossible to obtain standardised picture tests of good repute, it was decided to draw up special picture tests for this investigation. So as to make the comparison between picture and linguistic tests as close as possible, specially constructed or compiled linguistic tests were used instead of standardised tests, the same forms¹ of test were used in each type and the same number of examples was used in each form. It was thought that the best method of obtaining a common basis for the construction of "intelligence" tests was to accept tentatively Spearman's Principles of Cognition and to draw up the tests in conformity with those principles.

It will be remembered that Spearman distinguishes two classes of principles—his "noegenetic" principles and his "quantitative" principles. We are concerned mainly with the second² and third³ noegenetic principles in which it is stated that the mind has the power to educe a relationship between two fundaments and also to educe a correlate to a fundament when the relationship is known. Of the quantitative principles, the most important to us is the principle of retentivity⁴ which is applied very largely through the "anoegenetic process" of reproduction.

¹ The word "form" is employed when we refer to the setting of the test, e.g., "opposites" form and the word "type" when we wish to denote the kind of test from the point of view of presentation material, e.g., pictorial type.

² Spearman, *op. cit.*, p. 63.

³ Spearman, *op. cit.*, p. 91.

⁴ Spearman, *op. cit.*, p. 132.

In linguistic tests, this process may be put in train in either or both of two ways:

(1) Owing to differences between the subjects in training and opportunity, the test "material," *i.e.*, the language used and the ideas conveyed in that language, may be "old" to some subjects and "new" to others. In other words, the processes of eduction of relations and correlates which have to be carried through for one to obtain the meaning of a word, may have been performed, in the cases of some of the words used, by some of the subjects only. Certain vocabulary tests are anoegenetic for this reason.

(2) The language used in the tests may be fully intelligible to all subjects, but the relations or the correlates to be educed may have been previously educed by some subjects but not by others. This application of the principle of retentivity brings about a common weakness in linguistic tests in the "inventive" setting, as witness the following examples taken from Burt:

pigtail: Chinaman :: curly hair:
 knitting: girls :: woodwork:
 house: bricks :: cathedral:

It will be seen that "intelligence" tests should be based as much as possible on the noegenetic principles and that mere reproduction should not be the main process operating in the answering of test questions. That this can be done in the case of school children will be seen from an inspection of the following examples, in which the language is intelligible to most school children aged ten years, and the eductive process sufficiently difficult to bring about the downfall of children a few years older:

fish: salmon:: bird: nest, robin, sing, book.
 stove: iron:: book: cover, library, read, paper.

The object of taking great care in the construction or selection of examples is to try to prevent the formation of group factors due to influences other than the presentation material. Nevertheless, if there were available an ideal linguistic test in which every test situation demanded the use of a noegenetic process and in which the language was equally intelligible to all subjects, it would be possible still that some subjects would be more successful in a linguistic test than in any other type of test. Any advantage obtained by these persons would be due then to the presence of group factors, chief of which would be facility in dealing with ideas expressed in words.

If Spearman's principles are valid, they will apply to the mind's capacity for dealing with non-linguistic material

also. In the field of intelligence testing, the non-linguistic material used consists of pictures and the concrete material used in performance tests. Spearman and others have criticised very effectively picture interpretation tests, and there would seem little to be gained by comparing picture interpretation tests with good linguistic tests by way of further experiment. However, in certain passages too long to quote,¹ Spearman gives us the cue for further investigation into picture tests through the use of "visual percepts submitted to special treatment."

The chief difference between an intelligence test and a scholastic test is that, while the former is specially constructed to measure g , the latter, if it measures g at all, does so incidentally. Consequently, an investigation into scholastic tests must be conducted with tests whose sole aim is to measure the success of the testees in subjects of study. Nevertheless, before we can accept Spearman's two factor theory, we must find g at the base of success in all cognitive operations, including the solving of scholastic tests.

Our intelligence tests consisted of 150 examples, other than trial examples, in each of the two types. There were 5 forms of test with 30 examples in each form. The forms used were: Similarities, opposites, classification, analogies, completion.

The following scholastic tests were used:—

(i) Spelling—one list of 180 words taken from Ayres's list and another of 80 words taken from Ayres and Burt.

(ii) Arithmetic, Simple Operations—the Victorian Teachers' College Test.²

(iii) Arithmetic, Oral Problems—the last 40 of Burt's examples.³

(iv) Grammar—a special test of 50 examples in the form of a "new" examination, employing concepts with which the children had been long familiar and not requiring written answers.

(v) Geography—a special test of 40 examples, similar in form to the grammar test and based on the school course of study taken by the children tested a year before the time of testing.

Space does not permit us to publish many examples of the tests or an *a priori* analysis, but a few examples of the picture tests are given:

¹ Spearman, *op. cit.*, pp. 127-128.

² See *Victorian Education Gazette*, August and September, 1926.

³ C. Burt: "Mental and Scholastic Tests."

Opposites.

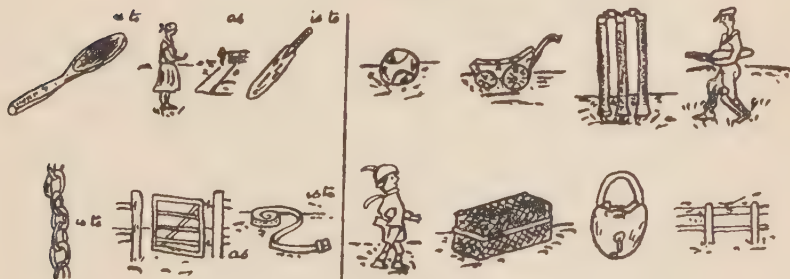
(The child selects from the four pictures on the right hand side of the line the opposite of the picture on the left hand side.)

*Classification.*

(A. One to be crossed out.)



(B. Four, and four only are alike.)

*Analogies.**Completion.*

Conditions of Testing.

All the tests were given as group tests, the children being tested in groups of from 40 to 60 children in size. Care was taken to prevent the intrusion of fatigue. The testing was spread over a number of days, and each group was tested at the same time each day.

The Subjects.

The children were of both sexes and were in two groups. Group A consisted of all the children between the ages of 10 years and 11 years 11 months attending a typical Melbourne elementary school, with the exception of a few children in the "infant" department. The average age of this group was 10 years 11 months, and the number of cases compared was generally about 140. The following tests were used with this group, and they were applied in the order given here:—Spelling (180 words), linguistic test, arithmetic, simple operations, picture test.

Group B was a grade group of 61 children whose ages ranged from 11 years to 14 years 6 months, and whose average age was 13 years. The tests used in this group are named here in the order in which they were applied: Picture test, arithmetic, simple operations, linguistic test, grammar, geography, arithmetical problems, spelling (80 words).

In each case the interval between the testings with the linguistic and picture tests respectively was 10 days.

SECTION 2.—SEARCH FOR GROUP FACTORS AND FOR "g" IN TWO INTELLIGENCE TESTS AND TWO SCHOLASTIC TESTS.

The first treatment of results consisted of intercorrelating the scores gained in the tests. All coefficients of correlation were obtained by using the Bravais-Pearson product moment formula.

TABLE I.
Intercorrelation of Complete Tests Used with Group A.
(N. 128-145.)

	Pict.	Ling.	Arith., S.O.	Spell.
Pict.	—	(.66)	.36	(.44)
Ling.	.66	—	.52	.70
Arith., S.O.	.36	(.52)	—	(.64)
Spell.	.44	.70	.64	—

(The Probable Errors are given in Table II.)

An inspection of the table reveals the fact that, when allowance is made for the probable error in each case, the correlations for picture-linguistic, linguistic-spelling and arithmetic-spelling are appreciably higher than the other correlations shown. This suggests a possible close relationship between the pairs named.

Tetrad Difference Criterion.¹

The application of this criterion to the table gives us two tetrad differences appreciably greater than 3 P.E. and even greater than 5 P.E.:—

$$\begin{array}{c} \text{e.g., } r_{lp} \times r_{sa} - r_{sp} \times r_{la} \text{ should} = 0, \text{ within 3 P.E.,}^2 \\ \text{i.e., } .66 \times .64 - .44 \times .52 \text{ should} = 0, \end{array}$$

but the actual tetrad difference is .1936 P.E. .028. The other tetrad difference which exceeds zero by 3 P.E. is

$$r_{pl} \times r_{sa} - r_{sl} \times r_{pa}.$$

There is no proof, then, that the only factors present when the picture-linguistic and spelling-arithmetic are concerned are g^3 and s . On the other hand, it does not follow that group factors are operating. The result of our applications of the criterion is merely that we now more strongly suspect the presence of one group factor for picture-linguistic and another for spelling-arithmetic. Since the only other tetrad difference obtainable from the table is considerably less than 3 P.E. and since the correlation for linguistic-spelling plays no part in producing a big tetrad difference, our suspect pairs are reduced from three to two in numbers.

Partial Correlation.

Another method of demonstrating the absence or probable presence of group factors is to calculate the coefficients of partial correlation between the pairs of abilities concerned. The ordinary coefficient, *i.e.*, the coefficient of "total" correlation, indicates the full relationship between two abilities, but this full relationship may be produced not only by a factor common to all the abilities measured, but also by a factor common to the two specific abilities only. In other words, the coefficient of "total" correlation is determined both by g and group factors (if any), while the coefficient of partial

¹ See June, 1926, issue of this journal, pp. 143-145; Dr. Davey's article already mentioned; and article by C. S. Slocombe, page 93, *The British Journal of Psychology*, General Section, October, 1926.

² The suffixes are the initial letters of the names of tests, *e.g.*, r_{lp} represents coefficient for linguistic-picture.

³ Here and on the following pages, we use g to represent the factor common to all operations involved in solving the tests in a series of tests.

correlation is determined by the common specific factors only, *i.e.*, by the group factors.

Our partial correlations were found by way of the "intellective saturations"¹ of the various tests. The term "intellective saturation" is used by Spearman as a name for the correlation between "the hypothetical general factor," *g*, and whatever is measured by a given test in one or more applications. Provided that the tests are sufficiently numerous and diverse, the intellective saturation can be taken as an indication of the degree to which *g* is involved in solving the particular test. Since there are four tests only in the series with which we are dealing, the actual intellective saturations are not of great consequence.

The formula for finding the intellective saturation is derived from Yule's theorem,²

$$r_{12 \cdot 3} = \frac{r_{12} - r_{13} \cdot r_{23}}{\sqrt{1 - r_{13}^2} \cdot \sqrt{1 - r_{23}^2}}$$

and is written as follows:

$$r_{ag} = \sqrt{\frac{A^2 - \bar{A}}{2T - 2A}}$$

where *a* = any one test,

A = the sum of the correlations of *a* with every other test,

\bar{A} = the sum of the squares of these correlations,

T = the total of all correlations between different tests.³

The partial correlations to the first approximation are found by substituting, in Yule's formula, values for *r_{ag}*, *i.e.*, the intellective saturations, and the total correlations concerned. The partial correlations for the tests used on Group A are given in Table II.

TABLE II.
Partial Correlations of Complete Tests Used with Group A.

Tests.	$r_{a \cdot b}$	$r_{ab} - r_{ag} \cdot r_{bg}$	P.E. r_{ab} .
Picture-Linguistic	+ .32	+ .11	.033
Picture-Arithmetic, S.O. . .	-.06	-.04	.047
Picture-Spelling	-.13	-.06	.045
Linguistic-Arithmetic, S.O. .	-.19	-.07	.042
Linguistic-Spelling	-.07	-.02	.030
Arithmetic-Spelling	+ .24	+ .11	.033

¹ Hart and Spearman, "Mental Tests of Dementia," pp. 24-30.

² Udney Yule, "An Introduction to the Theory of Statistics" (1924 edition), page 239.

³ This key was printed wrongly in the July, 1926, number of this Journal.

Spearman regards partial correlations of this kind as significant only when the difference between the actual coefficient of correlation and the product of the intellectual saturations, *i.e.*, $r_{ab} - r_{ag} \cdot r_{bg}$, exceeds three times the probable error of the actual correlation. Applying this criterion to Table II, we find that there are significant partial correlations for picture-linguistic on the one hand and arithmetic-spelling on the other. This confirms our earlier suspicion of the presence of a group factor in each of these cases.

Treatment of the results of the testing of Group B with the same four tests gives further evidence of the presence of a group factor for arithmetic-spelling. In the case of the picture-linguistic pair the value for $r_{ab} - r_{ag} \cdot r_{bg}$, though appreciable, is less than 3 P.E.

Evidence Regarding the Presence of a Factor Common to the Four Tests and the Identity of this Factor.

Since for every pair of tests except the two pairs already mentioned, the correlations between the specific factors are not significant, the total correlation for each of these pairs must be due to the influence of a factor common to all the tests in the series. In the case of the Group A subjects (Table I.), $r - 3P.E.$ is positive in every instance. Therefore, there is clearly a common factor making for success in intelligence tests and scholastic tests. With the reservations made earlier in this article, the factor may be called *g*.

We may now ask whether this *g* is a result of schooling. To answer this question, we have divided Group A into two sections according to school grading, so that we now have three groups, A_1 , A_2 and B. School grading indicates that the children in Group A_1 are the least intelligent and those in Group B the most intelligent.

TABLE III.
Intercorrelations of Four Tests at Different Levels.

Tests.	Group A_1 (Av. Age 10-9). N. 60-65.	Group A_2 (Av. Age 11-1). N. 76-82.	Group B (Av. Age 13). N. 61.
Picture-Linguistic .. ..	.61	.59	.36
Picture-Arithmetic, S.O. . .	.31	.13	-.07
Linguistic-Arithmetic, S.O. .	.60	.27	.30
Picture-Spelling .. ..	.30	.10	.20
Linguistic-Spelling .. ..	.60	.64	.49
Arithmetic-Spelling .. ..	.69	.44	.50

If, as it is sometimes contended, success in a linguistic test is determined largely by schooling, it is reasonable to expect significant increases in the coefficients of correlation as

we pass from the lower group towards the upper group, for the influence of schooling will be greatest on the children who are in the upper school grades. The figures in Table III, however, show no such increase, and in the case of linguistic-arithmetic, as in the case of picture-arithmetic, the coefficients are appreciably greater for the lowest group than for the other groups.

We are forced, therefore, to dissent from the opinion that success in linguistic group tests is due to the effects of schooling and to accept the view that the *g* which has some influence in producing success in each of the tests is something other than a result of teaching.

Relative Values of Tests.

Table III shows clearly that the best measures of *g* are the linguistic "intelligence" test and the spelling test. This result is supported by the intellectual saturations of the various tests and by the comparative degrees of agreement between the rankings of pupils by the various tests and by class teachers.

The low correlations between the picture test and other tests at the higher levels is not due to the easiness of the examples or to a lack of interest on the part of the children. The range of scores in the picture test for the senior group was 55-140, the distribution was normal, and the mean score was 97. It is clear, therefore, that the picture test measured something. The indication is that, while it measured *g* to some extent in the younger children, the ability measured by it in the case of the older children was largely a specific ability. It is possible that the younger children are more in the habit of educating relations and correlates from perceptual presentations than the older children are, and that the actual growth of intelligence beyond the mental age of 11-12 shows itself in an increased ability for dealing with words and concepts.

The reduced value of the arithmetic, simple operations, test as a measure of *g* in the upper school grades is due to the fact that the test is distinctly more noegenetic in character for the younger children. To the young child the sums present opportunities for the education of correlates, the relationships involved being of the conjunctive-constitutive kind,¹ but in the case of the older children, the cognitive processes are less noegenetic, since the principle of retentivity is being expressed in the form of facilitation.²

(To be concluded in the next issue.)

¹ Spearman, *op. cit.*, p. 114.

² Spearman, *op. cit.*, p. 133.

RESEARCHES AND REPORTS.

A BI-MANUAL CO-ORDINATION TEST.¹

By JOHN T. DINGLE,

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Psychological tests of physical and motor capacity or skill have usually taken into consideration the working of only one set of muscles that are accustomed to be worked in a certain way. There are tests to measure the skill of the right hand only in certain operations, and alternatively, these may be applied to measure the skill of the left hand; but to date, no simple tests which will measure the disparate activities of both hands working in co-ordination appear to have been evolved.

A child at an early age can bring both hands together, yet he must be older still before he can bring both hands together for such a purpose as catching a ball, and still more advanced in age to make a comparatively skilled co-ordination as is required in skipping with a rope. However, one is not struck very forcibly that a co-ordination is going on when one performs these tasks. The explanation seems to lie in the native symmetry of the muscular and central nervous systems of the human body, so that when two movements of the same kind are made, one with the right side and the other with the left, muscles of the same kind are brought into play, and the same nervous centre controls both movements. Thus, swinging both arms, as in skipping or in club-drill, comes early and easily.

It is when the right and left hand are engaged in disparate tasks that the difficulty of co-ordination is felt. No longer can the two movements be carried out in a semi-automatic fashion. The subject now has to concentrate his attention on the task. A task of this kind cannot strictly be called motor co-ordination, though it is certainly one of co-ordination. The two movements are not performed absolutely by themselves without becoming connected with one another—they are undoubtedly co-ordinated in the cortex. Thus it will be seen that a task requiring that the two hands should be making disparate movements involves a strong degree of voluntary or concentrated attention.

Though a number of physical and motor tests involve voluntary attention, these tests are either entirely uni-manual or are cases of simple co-ordinations where the co-ordinating agents are doing similar tasks, such as the dotting test employed by McQueen.² Our test requires the subject to make with his left hand a dot in each of two squares, at the same time making with his right hand a cross in a

¹ Thanks are due to the headmasters, headmistresses and teachers of the schools where these tests were carried out, for affording the necessary facilities; also to Dr. A. H. Martin for the many hints and valuable active assistance given both in the method of applying the test and also in drawing up the report.

² "The Distribution of Attention," *Brit. Jour. Psych.*, Mon. Supp., Vol. V.

square opposite these two. This constitutes one unit of the test. A trial sheet is given to each subject, consisting of twenty units, the first two of which are completed to serve for practice. After the trial effort a full sheet of sixty units is given. The following is a sample showing four units, two of which are completed:

1	•	•
2	•	•
3		
4		

×
×

The test has been devised with the following objects in view:

- (a) to discover individuals who are skilled in motor capacities involving the use of both hands in disparate movements, such as is required in working lathes, etc. The value of an objective measure of such skill in the industrial world is immediately apparent;
- (b) to study the processes underlying such capacities. It would seem, for instance, that such a test would be a valuable aid to the measurement of attention.

On the trial sheet is detailed the following instructions "Upon the word 'go' make a cross in the right-hand square opposite Number 3 with your right hand, and at the same time make a dot in each of the squares opposite it on the left with your left hand. Keep on working down the page. When you have finished the first column, go on with the second. Work as quickly as you can, but always be accurate. The first two items are done as they should be." In administering the test to groups the instructions were also read aloud, and a demonstration showing the correct movements done slowly was given on the blackboard.

The time allowed for the trial sheet was twenty seconds. On the completion of this the full sheets were passed out. The time allowed for this test sheet was one minute. The scoring was by the all-or-none principle, *id est*, each unit was either right or wrong, no partial credits being given.

In Table I are set out the scores of boys and girls from twelve to sixteen years old. In Table II are given derivative data obtained from Table I.

Thus it will be seen that age-norms were obtained for groups between the ages of twelve and sixteen years inclusive. The ages were taken in such a way that there was half a year on each side of the actual age, *id est*, the age itself became the median for the group. For example, thirteen year old children comprised all children between the ages of $12\frac{1}{2}$ and $13\frac{1}{2}$ years. Work was done with children below the age of twelve, but apparently the results are of little or no value, since in the majority of these cases the children failed to co-ordinate their

movements. A number of cases above the age of sixteen were obtained, but these were insufficient to give final results.

TABLE I.

Scores.	Boys. Number of Cases.					Girls. Number of Cases.				
	Age 12	Age 13	Age 14	Age 15	Age 16	Age 12	Age 13	Age 14	Age 15	Age 16
5-8	2	—	—	—	—	2	—	—	—	—
9-12	4	2	—	—	—	—	2	2	1	—
13-16	10	8	3	3	1	11	12	8	6	9
17-20	23	28	27	10	6	14	20	19	12	2
21-24	31	30	23	15	13	26	26	22	20	4
25-28	22	42	26	24	11	18	29	23	20	12
29-32	15	27	24	26	13	17	26	24	20	9
33-36	1	4	8	15	8	8	6	11	12	9
37-40	1	2	7	6	8	1	8	5	5	1
41-44	—	3	2	3	2	2	—	4	5	2
45-48	—	—	2	2	—	—	1	1	1	1
49-52	—	—	—	4	1	1	—	1	—	1
53-56	—	—	—	—	—	—	—	—	—	1

TABLE II.

Age Group.	Boys.			Girls.		
	Number of Cases.	Average.	Standard Deviation.	Number of Cases.	Average.	Standard Deviation.
12 years ..	109	22.4	5.8	100	24.6	6.9
13 years ..	146	24.5	5.9	130	25.1	6.7
14 years ..	122	26.3	6.6	120	26.3	7.7
15 years ..	108	29.1	7.6	102	27.3	7.2
16 years ..	63	28.9	7.6	51	28.2	9.4

Out of 1,067 cases used to obtain these results, sixteen had to be discarded on account of error in working, that is about 1.5 per cent. In only four of these cases was the trial sheet done incorrectly.

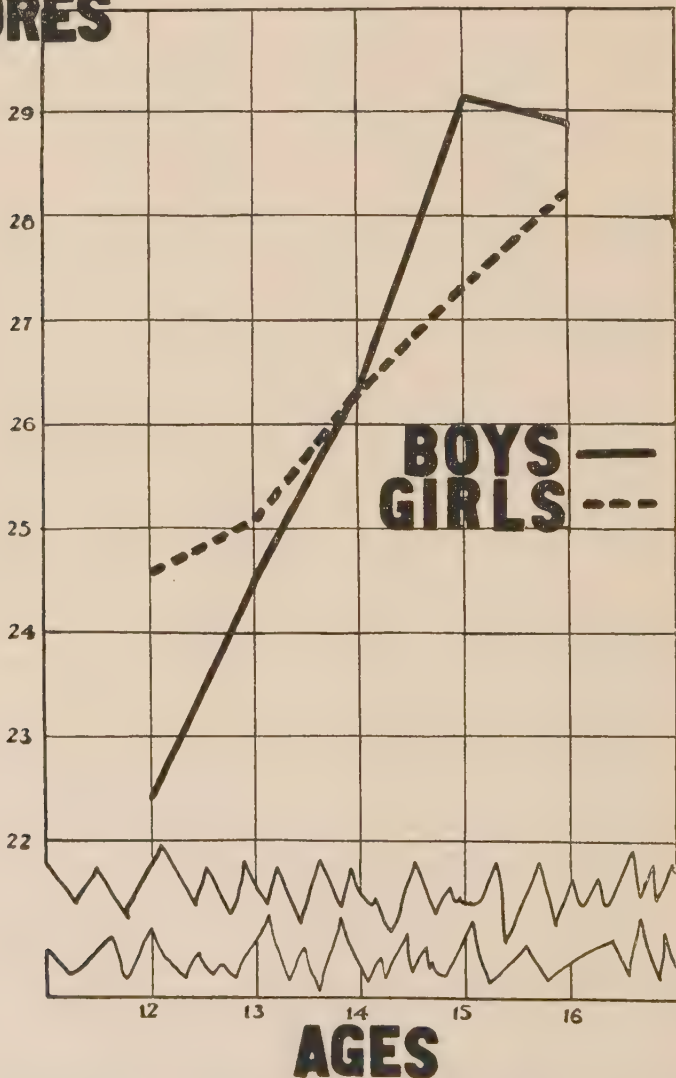
The average for twelve year old girls is 24.6, and that for the same group of boys is only 22.4. The average for thirteen year old girls is 25.1, while that for the same group of boys is 24.5. In the fourteen year old groups both averages are the same. It seems that this is caused by the fact that girls arrive at puberty about the age of twelve years, whereas boys do not reach this stage till about the age of fourteen. It is at fourteen that the scores of the boys have caught up with those of the girls. After this age the boys' scores show a definite increase on those of the girls. This is shown graphically below.

The score of the sixteen year old boys is slightly below that of the fifteen year boys. Perhaps the small number of cases taken in the sixteen year group or else an unrepresentative sampling would account for this.

In many cases were observed, especially among the younger children, what may be presumed to be the effects of concentrated attention. This was manifested in a wagging of the head from side

to side as though the child wished to see that both hands were doing the correct thing. Comparable with this are the often exaggerated movements of the head of a child learning to write.

SCORES



Though the figures obtained show the differences from age to age by no means great, yet these differences are constant throughout, as the graph shows. However, a longer period devoted to the performance, say two minutes instead of one, would accentuate these differences.

If the test were standardized in this form it would doubtless fulfil its original purpose in providing a reliable objective measure of bi-manual co-ordinative skill.

SUMMARY.

1. There is a small but constant age differentiation shown in the results.

2. Boys are inferior to girls below the age of fourteen years.

3. Boys are superior to girls above the age of fourteen years.

3. Boys are superior to girls above the age of fourteen years.

4. Judging from the results of the boys, it would seem that, as in the case of most mental and physical motor tests, there is a slowing down or cessation of development of the co-ordination ability about the age of sixteen years.

5. The test is apparently too difficult for most children below the age of twelve years.

6. It would seem that concentrated or voluntary attention enters to a very large extent into this test.

7. The test would seem to presuppose a certain degree of development in intelligence for its successful performance.

NOTES BY THE WAY.

VI.

"I realized that a concept which was not at the same time a judgment of the particular was as unreal as an intention that was not at the same time an action." (*Benedetto Croce: An Autobiography.*)

VII.

"For the unity of philosophy and history means just this, that all thought is philosophy, whatever it is about and in whatever form it is cast." (*Benedetto Croce: An Autobiography.*)

REVIEWS.

AN INTRODUCTION TO THE STUDY OF EDUCATION AND TO TEACHING. By E. P. Cubberley. xvii + 476 pp. G. G. Harrap & Co., Ltd.

Judging by the output of books, the American Professor of Education appears to have more leisure or more clerical assistance—or both—than the average English Professor of Education. Professor Cubberley, already well known in the educational world by his writing, has added another book to his list. In this book his avowed aim is to write “A general introductory survey course in education,” although his title reads as above. We fear that he has been over ambitious and that his work is somewhat overloaded for an introductory course. Especially is this so when it is considered that he desires to appeal to the general as well as to the professional reader.

The topics range from the philosophy of education to educational finance. About half the book deals with American conditions and practice. This undoubtedly is extremely helpful to the American student, but deprives the book of much of its value as an introductory text for non-American students. For the latter, the book might well be used as a first study of American education after they had received an introductory course illustrated from the practices of their own country.

The author is rather too explicit in his directions to lecturers who may be using his book in class. One wonders why this spoon-feeding is necessary. It is unfortunate too—for Australian readers—that the publishers' names are omitted from the book lists.

The foregoing remarks should not be taken to mean that the book is not well written. It is stimulating and reflects the more modern tendencies of education. He describes the school of today as a place where children learn life by living it, and contrasts it with the older type of school which encouraged overmuch the colourless negative qualities of obedience, docility and submission. Teachers of today stand as “Stimuli to pupil activities” instead of being mere drill-masters. With regard to the training of teachers, his thesis—one accepted by educationalists, but not always by the practising teacher—is that preparation for teaching should be broad rather than narrow.

He writes interestingly on mental and scholastic tests and their relation to school classification, and duly warns the beginner about relying too much on the I.Q. alone. The learning process and the teaching process are each given a chapter. The latter includes a classification of lesson types in which the oral information lesson is neglected altogether and the appreciation lesson is not treated as it deserves. The classification is not as satisfactory as that given in “The Ground-work of Teaching” (Mackie).

His treatment of the curriculum reflects the present healthy discontent with curricula as they are. The chapter on the school plant includes an account of the school building survey. Seeing that our school population is growing apace, this is a movement with which we might well make ourselves conversant.

The author does not deal as skillfully with the problem of the rural child as one would expect, and the references cited omit some of the newer and better books even of American origin.

A discussion of “The Increasing Size of our Educational Problem” brings to light some interesting facts. For example, 35% of the school population of the United States now receive High School education as

against 5% in 1870. Again, the nation spends almost as much money on "candy" as it does on education.

In the last chapter, that on "Progress and Problems in the Organisation of Education," Cubberley gives us a valuable summary of the present position. His attitude is best summed up in his own words: "The field of Educational Research has as yet hardly been scratched."

R.G.C.

FAMILIAR BELIEFS AND TRANSCENDENT REASON. By the Earl of Balfour, being the Hertz Lecture, delivered to the British Academy, 9th December, 1925. Oxford University Press. Pp. 18. Price: 1s. net.

The central beliefs which we hold about men and things, and without which we could not adapt ourselves to a social and natural environment, are not self-evident and cannot be proved. We require some guarantee that they are at least "on the way to truth." Certain natural forces seem on the whole to bring about reliable beliefs, but regarded as chance results of undirected energy, they could not give us the required guarantee. We must assume a transcendent Reason, directing Nature throughout its evolution and guiding us to truth. Only thus, Lord Balfour claims, and not on the naturalistic hypothesis, can we reconcile the rational and causal aspects of belief.

But where, a naturalist may ask, is the problem? Certain natural processes bring about processes of believing. When these processes come about, the things believed are regarded as true. If we are to criticize, or to find a guarantee for, any such belief, it can only be in terms of *other* things we regard as true. No transcendent guarantee is possible, but none is required. It is enough that persons should state what they find to be the case; that they should believe, and be able to point out, that one type of natural (i.e. observable) occurrence regularly follows another. In this way the dualism of chance and guidance, of rational and mechanical explanation, simply does not arise; and the reduction of observed facts to motions of electrons and their elevation to "spiritual possessions" are equally inadmissible.

JOHN ANDERSON.

A STUDY IN SOCIAL ECONOMICS: THE HUNTER RIVER VALLEY.

By F. R. E. Mauldon, B.A., M.Ec.W.E.A. Series, 1927. Robertson and Mullens, Melbourne. Retail price: 12s. 6d.

The Hunter River coalfield ranks about twelfth among the world's coal regions. It is the only large field right on the Pacific Coast, and this fact will become of more and more importance as the world "shrinks." The book under review deals, therefore, with a most interesting subject. The regional survey of the Hunter Valley naturally differs from most others in Australia in that it lays much more stress on industrial problems, for the region contains some of the largest industrial plants in Australia.

There are nine chapters in the book, of which three cover the regional geography and geology, three deal with economic products in some detail, and three largely with forms of industrial organization. The author commences with a discussion of three fundamental maps,

dealing with the topography, geology and occupations. These are clear and well drawn; but contours (such as have been broadcast by the Weather Service for years) might have been used in the first map. The economic effect of the very interesting "dry loop" penetrating the highlands by way of the "Cassilis Gate" is fully appreciated. Some idea of the wealth of the valley may be gained from figures which the author quotes. Some one hundred and eleven millions sterling have been gained in the mines, and possibly 58,000 millions sterling remain untouched. Readers will appreciate the comments (often given in footnotes) which refer to rival industrial regions outside Australia. For instance, the Kailan mine in North China produces 6,500 tons daily, and far outranks any but a few American mines.

The chapters on the subregions are interesting, for the Hunter Valley is purely pastoral in the dry west, there is much mixed farming in the centre, and it is largely industrial in the south-east. Thus it is truly a "microcosm of national problems," as the author suggests.

The coal-mining industry is considered from several special points of view. Firstly, the waste appears to have been colossal, amounting to 50% in the actual winning of the coal. Secondly, marketing problems are discussed, especially the decline in the overseas trade. This is definitely stated to be due to loss of time by the ships in consequence of strikes. Furthermore, owing to local awards, Australian coal per ton costs about ten shillings more than British coal in the East. Thirdly the grievances of the miners are analysed and appear to be concerned primarily with safe-working of the mines, compensation cases, and the "darg," *i.e.* pooling the available work.

An interesting account is given of these great industries. The Broken Hill Steel Works occupy many pages. We are told that nearly 6,000 men are employed in Newcastle and an equal number elsewhere. Walsh Island shipyards and the Sulphide Corporation (which produces sulphuric acid and superphosphates) are the other outstanding plants. Trade depression finds a place in this chapter. In Australia it was most acute one year later than in Britain and America.

The book is a good example of a very satisfactory liaison between the work of the geographer and of the economist. The reviewer has met with no other similar study of so comprehensive a nature—and it is hoped that it will be widely used as a foundation for discussions on Australian development.

GRIFFITH TAYLOR.

HUMAN BEHAVIOUR: A FIRST BOOK IN PSYCHOLOGY FOR TEACHERS, by S. S. Colvin and W. C. Bagley.

The title of this book is misleading, for the authors are in no wise "behaviourists." From the outset the "directive function of consciousness" is recognized, and the book opens with an analysis of consciousness. The book is professedly elementary, and its treatment is accordingly largely descriptive, with careful definitions of all terms used. The relation of psychology to practical teaching is kept in view throughout, as for instance in the discussion of attention, which is described in its varieties, but not explained, although suggestions are made as to how attention may be caught and held. The treatment of even the controversial departments of psychological theory is fairly orthodox. A series of questions and exercises should make the book useful to the teacher of young students.

E. RONALD WALKER.

LIVELIHOOD. By J. Alexander Gunn, M.A., B.Sc. (Oxon), Ph.D. 1927. Melbourne. A. H. Massina and Co. Pty. Ltd. Pp. 232. Price: 10s. 6d.

This book forms the second portion, we are told, of a larger work entitled "Human Society." The other three sections of this work, dealing with Breed, Government, and Culture respectively, are to be published later.

The book itself, however, affords not the slightest indication that it is part of a larger whole. No attempt is made to show the connection between Livelihood and the other three factors which, with it, make the "complex" of "society." It is just one of the multitude of books upon economics, and as such it must be judged.

Its chief fault is one which it shares with many others: the lack of any logical arrangement. One chapter follows another for no apparent reason. Professor Gunn does not seem concerned to answer any particular questions or to consider any general problems so much as to present under different headings various items of information and a number of judgments and comments upon particular points.

Yet Economics has a distinct subject matter: the more material side of human welfare. The main purpose of a book upon economic theory, such as this, should be to classify and explain the various factors which affect the "material welfare" of people (and especially, perhaps, of a nation) living within the framework of a certain system of social organization. The material welfare of a nation clearly depends largely upon how much is produced and upon what is produced. Hence it is usual to have a large section upon "Production," dealing with the various influences which affect this, and, therefore, material welfare. In this book there are merely a few remarks upon Land, Labour, Capital, and Management, in place of such a discussion. Again, material welfare depends partly upon the extent of inequality of incomes. There is a section upon this. But the reasons for this inequality of incomes cannot be properly explained because the author has not yet dealt with the Theory of Value; and the cause of differences in incomes is largely a question of value. The remaining two factors upon which the material welfare of a nation depends are working conditions and the terms upon which it exchanges its produce for that of other countries. Neither, as such, is discussed; instead, we are given a chapter upon Trade Unions and Trusts, and another which deals with Free Trade and Protection.

Apart from this lack of arrangement and from the omissions which have been noted, there are no serious defects. Some rather lengthy quotations are included; but it is perhaps better to give the views of other writers in this form than to provide a possibly inadequate paraphrase or summary. The style is quite pleasing, and the book covers a wide range of topics. It will doubtless satisfy those students who wished to see Professor Gunn's lectures in print. But there are several works which are undoubtedly more suitable than this "as a primer or text-book for students of social science in one province of their work."

F.C.B.

SUPERPERSONALISM. THE OUTER CONSCIOUSNESS. A BIOLOGICAL ENTITY. By W. D. Lighthall, LL.D. (McGill). The Witness Press. Montreal, Canada. Price: 4s.

Dr. Lighthall's speculations on Superpersonalism and the Outer Consciousness will be read with great interest and with advantage by those who are on the lookout for fresh viewpoints in philosophy and

are content when the author imparts to them the results of his vision of the nature of things, and presents these in a lucid and orderly way. The more exacting reader will miss the detailed and systematic justification by reference to fact and to experience. There is no close analysis of fact or experience which, as it were, thrusts the hypothesis of the Superpersonal upon us as a *vera causa bene fundata*.

The main directive agency in evolution is an Outer Consciousness, similar in nature to the "inner" we are familiar with in our own experience, but independent of it and immeasurably more powerful. As a purposive agency its tendency is to promote joy and to promote it universally. Indirectly, and through their relation to joy, it promotes truth, goodness, and beauty, but these are not separate values, the "sole basis of value" being joy (§ 214). The Outer Consciousness or "hyperpsych" possesses the attributes of a person (§ 50), and our author refers to it as "the Person of the Outer Consciousness" and "the Person of Evolution;" but as the personality operates on such a vast scale it is best referred to, we are told, as a Superperson. In last resort all life is the life of this Superperson, the Person of Evolution, the one wholly independent individual.

Dr. Lighthall, through the stress he lays on the instinctive basis of the Outer Consciousness and on the colonial view of the human individual, comes into touch with the well-known theories of Professor MacDougall, and the book would have gained greatly in cogency had its main theses been developed so as to bring out their relation to those of the author of "Social Psychology" and the "Two Outlines." MacDougall's theories have a broad basis in the facts of psychology, normal and abnormal, and it would be an important vindication of Dr. Lighthall's views could they be shown to connect themselves naturally and in detail with the views of so thoroughgoing a thinker and with the facts of life and development upon which these views depend.

Dr. Lighthall does not develop in any fruitful way the crucial relation between the "personal" and the "superpersonal." If the latter term is to be adopted we would wish to know more precisely wherein the Person of Evolution differs from the personality of the human individual, and whether the difference is of such a nature as to justify its adoption.

W.R.B.G.

THE PSYCHOLOGY OF THE METHODIST REVIVAL. By Sydney G. Dimond. 1926. Oxford University Press. Pp. 296. Price: 10s. 6d. net.

The "empirical and descriptive study" attempted by the author is well done and should appeal to a wider class of readers than the title itself is likely to attract. It is historical in method, and shows the impartial spirit of scientific research. An earlier draft of the book, so we are told, was submitted as a dissertation for the degree of Master of Arts in the Leeds University. That does not in the least detract from the interest or value of the work as now published. The author makes a free use of original sources (including some hitherto unpublished manuscripts), and the very full bibliography furnishes evidence of his wide reading. Instead of writing on the psychology of religion in general, the author selects a well-defined period of history, dating from the conversion of John Wesley (1738) to the end of the revolutionary era (1815), which is peculiarly rich in the phenomena of religious experience. He then proceeds to make a psychological study of the data available, in the light of recent research in such fields as suggestion, behaviourism, and psycho-analysis.

After an interesting chapter on the "Historical Background of the Revival," the author makes a discriminating study of the mind of John Wesley as revealed in his daily conduct, habits of work, social adaptability, emotional equipment, personal peculiarities, love, and marriage. His conversion and subsequent spiritual experiences are carefully analysed. The "Genesis of the Revival" is next outlined, and the facts by which it was accompanied are considered in detail as possible examples of collective (crowd), instinctive, or abnormal behaviour. The treatment here is critical but sympathetic. The "group spirit" and distinctive doctrines of early Methodism are also examined psychologically and carefully appraised as social factors. The concluding chapter on "Historical Values" sketches some of the relations of the Revival to the Romantic Movement in literature and to the Industrial Revolution as contemporary events, and shows the important part it played during the political crises through which England passed at the time and during the first half of the nineteenth century. The Oxford Press has done good work, as one would expect, in the matter of printing and binding, but it is only in keeping with the contents of a very sound and interesting book.

M. SCOTT FLETCHER.

EDUCATION AND SOCIAL WELFARE IN SWITZERLAND. By A. J. Pressland. G. G. Harrap and Co. Cloth bound, pp. 109, with preface, bibliography, etc. 1927. Price: 3s. 6d. net.

Commemorating as it does the centenary of the death of Pestalozzi, 17th February, 1927, this concise volume reviews not only the career and labours of that pioneer of modern elementary education, but also the present condition of education and social welfare in Switzerland. It is the distinction of Pestalozzi that, notwithstanding repeated practical failures, he inspired profound and widespread interest in the process of instruction by means of objects to develop the intuitive powers of children, and in the possibility of promoting social reform by the extension of education of this type to the humblest members of the community.

Mr. Pressland has long specialized in the study of Swiss education, and his brief but comprehensive account of the existing condition of the schools and child welfare institutions of Switzerland is authoritative as well as timely. Under an Act of 10th February, 1919, Canton Zurich established a Jugendamt (Young People's Welfare Office), the director of which advises the young upon the choice of careers. Leaflets are issued by the Jugendamt descriptive of particular trades. The teacher co-operates with a professional adviser. On leaving school a child is medically examined and may be advised to seek rural or outdoor employment in accordance with the result. Frequently the adviser dissuades children from spending time on odd jobs or from entering the ranks of unskilled labour. The Swiss practice is the more interesting in that New South Wales has recently established a Bureau of Educational Guidance.

P. R. COLE.

A STUDY OF GERSONIDES IN HIS PROPER PERSPECTIVE. By Nirna H. Adlerblum, Ph.D. New York. Columbia University Press. 1926.

This short sketch of 140 pages, plus 10 pages of Bibliography, has a twofold purpose—(1) to give a short account of the life and teaching of Levi ben Gershon, a Jewish scholastic who wrote in the first half of

the fourteenth century, and (2) to show how "Jewish mediæval philosophy cannot be classed with general scholasticism, as the historians are wont to do (the authoress is responsible for this bad grammar), both on account of its tradition and its own mode of thinking."

The first part is a handy résumé for those not acquainted with the larger works on Jewish philosophy of the Middle Ages.

The attempt in the second part (chiefly in Chapter IV) "at drawing the Jewish setting" is not quite satisfactory. Judah Halevi is accepted as the type of the Jewish philosopher, and the thought of Gersonides is compared with his. The final object of this is to "ascertain, in the course of our research, what distinguishes Jewish philosophers *qua* Jewish." Undoubtedly the authoress has done something to help her readers in this direction, but her treatment is not complete.

G.W.T.

FRANCIS THOMPSON AND HIS POETRY. By the Rev. T. H. Wright. Harrap. Poetry and Life Series.

This little book is more expository than critical. Mr. Wright explains that his aim is "to illuminate the poetry by the life, and the life by the poetry," and if the book strengthens in some readers a conviction that Thompson was overmuch, and almost morbidly, occupied with poetry about the poet and his soul, that is not Mr. Wright's fault but Thompson's. After a brief discussion of the melancholy life of Thompson and the characteristics of his poetry, the author explains some of the outstanding and more difficult poems. Lovers of Thompson will welcome this appreciative work, and those who have not yet become familiar with his poetry will be glad of the guidance here offered.

J.L.G.B.

JOURNALS RECEIVED.

THE JOURNAL OF PHILOSOPHY. Edited by Professors Woodbridge, Bush and Schneider, Columbia University. Published fortnightly. 4 dollars a year.

Vol. XXIV. No. 8. April 14, 1927. Reason and Faith: William James. Notes toward the completion of a Bibliography of the Writings of William James: Emmanuel Leroux. No. 9. April 28. Our Knowledge of Other Minds: W. W. Spencer. What is the Correct Interpretation of Critical Realism? Roy Wood Sellars. No. 10. May 12. The Concept of the Symbol: Charles W. Morris. The Short-circuiting of Conscious Responses: Knight Dunlap. No. 11. May 26. The Concept of the Symbol (II): Charles W. Morris. The Twenty-eighth Annual Meeting of the Western Division of the American Philosophical Association: A. Cornelius Benjamin. No. 12. June 9. Also the emergence of Matter: Alfred H. Lloyd.

PSYCHE. Edited by C. K. Ogden. Kegan Paul, Trench, Trubner and Co., London. Published Quarterly. Price: 5s.

No. 28. April, 1927. Did the Chinese? Editorial. The Famous Schneider Mediumship: Warren J. Vinton. Individual Psychology: Dr. Alfred Adler. A Biological Theory of Resistance: E. M. Stephens. The Human Equation in Dialectic: Mortimer J. Adler. The Unity of the Senses: Erich M. v. Hornbostel. Consistency: Oliver L. Reiser. An Aeolian Theory: Scott Buchanan. Religion as a Psychic Necessity: J. H. Van der Hoop. The New Educational Psychiatry: S. D. House.

ARCHIVES DE PSYCHOLOGIE. Edited by E. Claparède. Geneva. London: Williams and Norgate. Price: 4 francs.

Vol. XX. No. 79. February, 1927. Contribution à l'Etude de la Constance des Sujets: Hélène Antipoff. Les Premiers Mots de l'Enfant et l'Apparition des Espèces de Mots dans son Langage: Elemer Kenyeres. Les Groupements Spontanés d'Enfants à l'Age Préscolaire: Eugénie Chevaleva. Mémoire Phénoménale pour les Dates: C. Klyssen.

THE ECONOMIC RECORD. Journal of the Economic Society of Australia and New Zealand. Melbourne University Press and Macmillan and Co. Price: 5s.

Vol. III. No. 4. May, 1927. Central Banking: Sir Ernest Harvey. Economic Welfare and Racial Vitality: W. Jethro Brown. The Course of Rural Land Values in New Zealand, 1914-25: J. B. Condliffe and H. R. Rodwell. The Tariff Board of Australia: R. C. Mills. The Industrial Revolution in the Far East: J. B. Condliffe. The Australian Tariff and the Standard of Living—A Rejoinder: J. B. Brigden. Vitality of White Races in Low Latitudes: C. H. Wickens. Reviews, Notes, etc.

ARCHIVIO GENERALE DI NEUROLOGIA, PSICHIATRIA E PSICOANALISI. Edited by M. Levi-Bianchini. Official Organ of the Italian Psycho-analytic Society. Annual subscription (outside Italy): 6 dollars. Teramo, Italy.

Vol. VIII. No. 1. April, 1927. Gliosi sottoependimale in un caso di paralisi progressiva a decorso rapido: A. Pfanner. Un caso di eunucofeminismo con parkinsonismo ed alterazioni psichiche consecutivo ad encefalite epidemica: L. Korst. Un chiaro ammonimento di prudenza e di condotta, agli antipsicoanalisti, da parte neutrale: M. Levi-Bianchini.

RIVISTA DI FILOSOFIA NEO-SCOLASTICA. Published by the Philosophical Faculty of the Catholic University of the Sacred Heart. Milan, Via S. Agnese, 4. Annual subscription (outside Italy): L. 28, 30.

Vol. XIX. No. 1. January-February, 1927. La filosofia della morte nell'idealismo gentiliano: Mariano Cordovani. La biblioteca del Cusano: Paolo Rotta. Se gli sviluppi superiori della geometria introducono elementi gnoseologicamente puri: Antonio Zamboni.

EDUCATIONAL OUTLOOK. Vol. I. No. 3. March, 1927. Some Aspects of Australian and American Education Compared: Percival R. Cole. Freedom in Study and Teaching: Thomas Woody.

WELFARE WORK. Journal of the Institute of Industrial Welfare. Monthly. London. 5s. per annum.

THE MEDICAL JOURNAL OF AUSTRALIA. Sydney. May 14, 1927. The Difficult Child: Dr. Bostock. April 16. Leading Article on Criminality and Mental Deficiency. April 30. The Treatment of Congenital Spastic Paraplegia by Sympathetic Ramisection: N. D. Royle, M.D., Ch.M. June 23. Leading Article on Spahlinger.

BOOKS RECEIVED.

AN EXPERIMENT WITH TIME. By J. W. Dunne. London. A. and C. Black.

PRIMITIVE MAN, HIS ESSENTIAL QUEST. By John Murphy. Oxford University Press.

TYPEN DER FARBENBLINDHEIT. By G. E. Müller. Göttingen. Vandenhoeck and Ruprecht.

NOTES AND NEWS.

Mr. R. F. Fortune, M.A., of Victoria University College, Wellington, who has been doing post-graduate work in Psychology and Ethnology at Emmanuel College, Cambridge, has been appointed to act as psychologist to the Cambridge-Sydney anthropological expedition to Melanesia. The firm of Kegan Paul is about to publish Mr. Fortune's book on dreams.

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A most successful meeting of the Wellington Local Branch of the Association was held in June when Professor T. A. Hunter read a paper on "Heredity and Environment in the Social Sciences." The reading of the paper was followed by keen discussion.

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By the generosity of Frank Albert, Esq., of Sydney, the sum of £50 has been made available for the Department of Psychology. This will enable an annual prize to be awarded to the student of Psychology II who achieves the highest distinction in the Second Year course. The prize is to be known as "The Frank Albert Prize in Psychology." Mr. Albert had already shown himself a good friend of the University by his generous assistance to the Faculty of Economics, and has since given the sum of £100 for prizes in the Department of Anthropology.

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Messrs. Macmillan and Co., of Melbourne, have now taken over the distribution of the Journal and the business connected therewith. This will greatly relieve the Hon. Secretary of the Association, Dr. A. H. Martin, whose devoted service for the last four years has cost him much time and labour.

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It is with special pleasure that we record the news that Emeritus Professor Francis Anderson, first Challis Professor of Philosophy in the University of Sydney, and first Editor of this Journal, has received from his *Alma Mater*, the University of Glasgow, the high distinction of the degree of LL.D., *honoris causa*.

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Miss Ruth Griffiths, B.A., of the University of Queensland, has been awarded a travelling scholarship to allow her to continue at Cambridge her studies and researches in Philosophy and Psychology. Miss Griffiths is a distinguished graduate, and the first woman to hold this scholarship.

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On Thursday, May 25, the Annual Meeting of the Sydney Local Branch was held at the University. The following office bearers were elected: *President*, Professor John Anderson; *Vice-Presidents*, Rev. Spence Little and Professor Lovell; *Committee*, Mrs. de Burgh, Mr. F. A. Bland, Mr. Dennis; *Honorary Secretary and Treasurer*, Mr. C. P. Gould; *Assistant Hon. Secretaries*, Mr. Bellingham and Mr. Cotter.

The following communications from the Psychological Laboratory were received:—

(a) "An Experimental Study of the Concept." By Mr. W. J. Weeden, B.A., Science Research Scholar in Psychology.

(b) "Tests of Persistency." By Mr. E. Ronald Walker, B.A., Lecturer in Economics.

Both communications evoked discussion.